
INTERNATIONAL ORGANISATION AND DISSEMINATION OF KNOWLEDGE

*Selected Essays
of Paul Otlet*

TRANSLATED AND EDITED
WITH AN INTRODUCTION

by W. Boyd Rayward



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I dedicate this book to my mother and father
Ellie and Warden Rayward

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PREFACE

These translations of a selection of Paul Otlet's writings have been a long time in preparation. Now put down, now taken up again over a period of ten years or so in Chicago, London and Sydney, they are dispatched at last to Amsterdam with relief. They follow an earlier biographical and institutional study of Otlet and the International Institute of Bibliography (now FID, the International Federation for Information and Documentation).¹ The publication of that work left me with a troubled sense of more that needed to be done, of an obligation incurred but not yet discharged.² It has always seemed to me that, though not entirely neglected, Otlet's contributions to our understanding of bibliography, documentation and what is now called information storage and retrieval, sometimes information science, and the technical and institutional arrangements needed to maximise their social utility, have not had the attention in the English-speaking world that is their due. It is my hope that the availability of this selection of papers in English, both in themselves and because of the attention that the act of publication can engender, will encourage a renewal of interest in Otlet's thinking about and work for the international organisation and dissemination of knowledge.

There are 17 papers in this volume. Most are short; all are complete in themselves but one, which is excerpted from a much larger work. Though I have arranged them in chronological order, they are essentially of three kinds. The first group comprises papers directly related to theoretical and practical matters of bibliography and documentation. They range from Otlet's first published thoughts on these subjects, "Something About Bibliography" in 1893, to "The International Organisation of Bibliography and Documentation" some 27 years later. Included here are two visionary papers on the documentary uses of microfilm written in collaboration with a remarkable inventor and engineer, Robert Goldschmidt; the first appeared in 1906, the second in 1925. I have not attempted to excerpt Otlet's magisterial and, in its detail and density, rather overwhelming *Traité de Documentation* of 1934. A reprint of the original French edition was issued in 1989 so that it is currently available in this form. It should be translated into English but that is a task for another.

A second group of papers deals with matters of international organisation in general (which also includes the organisation of bibliography and documentation) and in the context of what was to become the League of Nations and its Organisation for International Intellectual Cooperation. No appreciation of Otlet's life and work is possible without an

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1. W. Boyd Rayward, *The Universe of Information: The Work of Paul Otlet for Documentation and International Organisation*. FID Publication 520; Moscow: VINITI, 1975.
 2. W. Boyd Rayward, "The Times of Their Lives: A Personal Reflection on Biography and history," *Proceedings of the 4th Forum on Library History*. Clayton, Vic.: Monash University, 1990 (in press).

awareness of his passionate, utopian internationalism and his tireless organisational activity in this domain especially in the decade before, and the period during, the First World War.

The third group of papers is included because their more personal tone allows us to glimpse something of the shadow of the man himself. Here he is, having sent two sons off to the War, one lost in the Battle of the Yser, the other captured by the enemy and later interned in Switzerland, having to explain his presence in Paris in 1915 to the Prefect of Police. His internationalism in wartime was widely misinterpreted. Denounced in the French press and the subject of rumour among certain Belgians in exile as a pacifist and possibly traitorous, he faced conflict with the authorities (Paper 10, "Note for M. Durand, Prefect of Police").

In July 1931 the 28th Universal Peace Congress met at the Palais Mondial, that phantasmic, grandiose international centre that Otlet and La Fontaine had somehow conjured into a semblance of being as early as 1910 in the Palais du Cinquantenaire in Brussels. Otlet used the occasion to issue a "Belgian Appeal to the World" (Paper 16) in which he expressed his anguish at the direction of the events of the time, invoking in grandiloquent style the institutional solutions he believed would save mankind from itself. The congress was meeting as it were on the eve of the International Disarmament Conference which was to end two years later in irredeemable failure.

Finally, I have included Otlet's tribute to Henri La Fontaine on the occasion of the latter's 80th birthday (Paper 17). The two men had begun to work together in 1892 or 1893 and, companions and colleagues, they continued to develop ideas, and the organisations in which these ideas were embodied, from then on. Such a community of intellectual interests, political and social conviction, and action must surely be rare. In the history of the enterprises they initiated and so assiduously developed together for some fifty years, it is hard to disentangle their different responsibilities and contributions. Otlet's tribute encapsulates that lifetime of collaboration and mutual regard which ended only with La Fontaine's death in 1943.

In this connection, it is necessary to be aware that Otlet was an active and for some time influential man of affairs. He was also a scholar whose intellectual and organisational commitments were international and pan-disciplinary. In the Editor's footnotes to the papers in this volume, I have tried to provide as necessary a context, explanation, point of reference, clarification for what is mentioned, sometimes quite casually, in the text. The reader will come across references to obscure bibliographers ancient and modern, and publications of various kinds ancient and modern, as Otlet elaborated an historical context for his speculative, innovative ideas. He travelled widely in neutral Europe as the War dragged out its terrible course. He was in Paris while the Treaty of Versailles was negotiated (La Fontaine was an official representative of Belgium at the Conference of Peace). I have tried to identify events and issues that he mentions in passing as he might have understood them at the time. Sometimes I have a footnote on a footnote of his so that the reader will have some idea of what he is referring to. Sometimes there seems to be an error or obscurity in a reference or comment that he makes and I have discussed this in a footnote. I have particularly kept in mind what might help the understanding of the student who, in the course of his or her professional studies, might come upon this book from any one of a number of different backgrounds. Hence I have boldly included a note, for example, on the *Summa* of St. Thomas Aquinas and on Aristotle as well as notes on Zech du Biez, Henri Morel, the *Bulletin des Sommaires* and the regime of the Scheldt River. I confess I enjoyed the sleuthing that a number of the notes involved. I hope they will be useful. Tucked away at the end of each paper, they can, of course, be ignored.

"The Bibliography of the Works of Paul Otlet" at the end of the book is as complete as I have been able to make it. I have included one or two items I have found in "near-published" form in various libraries. It is a much fuller and more accurate bibliography than that in my earlier book. This contains a number of errors and omissions that are, in part my own fault and, in part, the result of the process of publishing in a country that was then effectively closed so that communication with the publisher was well nigh impossible save for an occasional telegram. I have a particular debt of gratitude in relation to the completion of the present version of the bibliography to M. Bruynseels of the Bibliothèque Albert I^{er} in Brussels, who, when I was on a rushed trip, arranged for me to have access to that library's stacks to search through runs of various periodicals, conference proceedings and so on for Otlet publications. The search for items in the last year or so has taken on a life of its own and has been great fun. M. André Canonne of the Centre de Lecture publique de la Communauté française in Liège contributed and so did Mr. Ben Goedegebuure of FID Headquarters in the Hague. I offer special thanks to M. Pieter Uyttenhove, now in Paris, who is studying urban reconstruction and development in Brussels after the two wars. He has sent references, found and copied articles for me and in general has helped strengthen my faith in the international community of scholars.

I have not tried to compile a complete bibliography of secondary source materials. There is a voluminous literature on the Universal Decimal Classification which I have for the most part ignored. What is included in the secondary list has been of particular interest to me either in or of itself or as representing a special kind of contribution. I have also included a selected list of sources I used in compiling the Editor's notes. In some places in the notes themselves I have included full references and they are not reproduced in this list.

At the University of Chicago, I had two splendid research assistants who have probably forgotten that they were involved in the inception of this project: Joyce Saricks and Kathleen Prendergast. I owe a particular debt of gratitude to Gerry Byrne for help with organising the typing of preliminary drafts of much of this material. That this book exists at all is owing to the enthusiasm and conviction of Stella Keenan, former Secretary-General of FID and to the continuing interest and support of Ben Goedegebuure, Executive Director of FID. Professor K.V. Sinclair of James Cook University in Queensland, with a generosity and cheerfulness I have long appreciated, has offered advice on particular issues of translation that I brought to him and has checked the bibliography for me. Nadia Kemfe of the University of New South Wales has also helped with problems of translation. Lesley Payne of the State Library of New South Wales has helped with proof-reading the text. Ann-Maree Walsh of the School of Librarianship at the University of New South Wales has been wonderfully patient and skilful at the word-processor as various revisions have been presented to her. Above all I salute Ray Locke of the School of Librarianship for help with the physical preparation of the text, help, as with all he does, that far exceeded the bounds of duty. A small Special Research Grant from the Faculty of Professional Studies at the University of New South Wales provided the funds needed to complete this project and for such mercies I am most grateful.

While acknowledging the various kinds of help I have received from the wonderful friends and colleagues mentioned above, I hasten to add that any errors that remain in this work are my responsibility alone.

W. Boyd Rayward,
February, 1990

ABBREVIATIONS

FID	Fédération International d'Information et de Documentation/International Federation for Information and Documentation
IIB	Institut International de Bibliographie/International Institute for Bibliography
OIB	Office International de Bibliographie/International Office of Bibliography
RBU	Répertoire Bibliographique Universel/Universal Bibliographic Repertory
UDC	Universal Decimal Classification
UIA	Union of International Associations

FOOTNOTES In Otlet's papers his footnotes are indicated by numbers in square brackets, [], in the text and appear at the bottom of the page. They are in the form in which they appear in the original papers.

The Editor's Notes are indicated by a superscript number and are placed at the end of each paper.

INTRODUCTION

We must bring together a collection of machines which simultaneously or sequentially can perform the following operations: (1) The transformation of sound into writing; (2) The reproduction of this writing in as many copies as are useful; (3) The creation of documents in such a way that each item of information has its own identity and, in its relationships with those items comprising any collection, can be retrieved as necessary; (4) A Classification number assigned to each item of information; the perforation of documents correlated with these numbers; (5) Automatic classification and filing of documents; (6) Automatic retrieval of documents for consultation and presented either direct to the enquirer or via machine enabling written additions to be made to them; (7) Mechanical manipulation at will of all the listed items of information in order to obtain new combinations of facts, new relationships of ideas, and new operations carried out with the help of numbers. The technology fulfilling these seven requirements would indeed be a *mechanical, collective brain*.¹

A... radical assumption would consider that all knowledge, all information could be so condensed that it could be contained in a limited number of works placed on a desk, therefore within hand's reach, and indexed in such a way as to ensure maximum consultability. In this case the world described in the entirety of books would really be within everyone's grasp. The Universal Book created from all books would become very approximately an annex to the brain, a substratum even of memory, an external mechanism and instrument of the mind but so close to it, so apt to its use that it would truly be a sort of appended organ, an exodermic appendage.²

Man would no longer need documentation if he were to become an omniscient being like God himself. A less ultimate degree would create an instrumentation acting across distance which would combine at the same time radio, x-rays, cinema and microscopic photography. All the things of the universe and all those of man would be registered from afar as they were produced. Thus the moving image of the world would be established - its memory, its true duplicate. From afar anyone would be able to read the passage, expanded or limited to the desired subject, that could be projected on his individual screen. Thus, in his armchair, anyone would be able to contemplate the whole of creation or particular parts of it.³

Who is Paul Otlet? Why should we be interested in what he did or tried to do and in what he wrote? He was a Belgian. His original profession was the law, though he soon turned to matters of bibliographic organisation and the organisation of non-governmental international relations. He lived from 1868 to 1944. A long life, its heyday, however, was the turn of the century and the period before the First World War. In the few photographs we have, most of them taken towards the end of his life, he is a slightly stooped old man. He peers out at us squint-eyed, heavy-lidded, through small, thick, round spectacles. His face, framed by a bushy but neatly-trimmed, snow-white beard and moustache is grave, unsmiling, its

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1. Paul Otlet, *Traité de Documentation...* 1989 (see "Bibliography of the Work of Paul Otlet" in this volume for bibliographic details) p.391
 2. Ibid. p.428.
 3. Paul Otlet, *Monde*, 1935, pp. 390-391.

expression more bitter than impassive. The photographs project an old-fashioned image, for those of us in middle age perhaps that of a long dead grandfather. What can he have to say to a society caught up in an information processing revolution so rapid in its development, so far reaching in its consequences, so complex and sweeping in the changes it is creating that it seems a hurricane of modernity? For the electronic youth of today, members of the microchip generation, he must appear incredibly ancient.

Yet, as the quotation at the head of the Introduction suggests, he proved to be prescient to a remarkable degree in anticipating the need for revolutionary kinds of technological development for accessing and manipulating information. He also realised that such developments would stimulate the setting up of new, and the expansion of old, forms of information services and that new kinds of organisational structures would be required to support them. He saw that radical re-thinking was needed if science, and learning more generally, were to continue to move forward freely and swiftly without becoming bogged down in the huge physical bulk of existing publications. He was vitally aware that, because of its escalating rate of production, its international character, its substantive and formal complexity, this ever-growing body of literature constituted, as it still constitutes, an increasingly impenetrable barrier to understanding and use. Derek de Sola Price was to designate it one of the diseases of modern science.⁴

For Otlet, then, key questions were: how best was order to be introduced into this proliferating, disorderly mass in such a way that progress in the world of learning could continue efficiently and effectively? How could rapid developments in all areas of knowledge, so characteristic of the modern period, be mobilised for the benefit of society? How could the international flow of information, then obstructed (as it still is) by political, social and linguistic barriers on the one hand, and by cumbersome, unresponsive systems of publication, distribution and bibliographic processing on the other, become more open and more effective? How could accurate, up-to-date, "integrated" information tailored specifically and exactly to particular needs be derived from this mass, re-worked to a form ensuring immediate and optimal usefulness, and made available without hindrance or delay, whatever such potentially infinite, unpredictable needs might be?

In his very first paper on bibliography (No. 1 in this volume), Otlet struggled to formulate questions of this kind and to examine possible answers to them. Literature both embodied what was known and hid it. The ultimate objective of bibliography was to identify what a work contributed to knowledge, to help disentangle what was true from what was false, what was objective from what was subjective, what was useful as theory and interpretation from what was idiosyncratic conjecture and misguided, and to record this contribution "atomistically" on cards so that the record could be manipulated in whatever ways were necessary to ensure immediate availability for use. He uses an image of "winnowing the best grain." How could the intellectual domains be adequately, continuously "mapped," a metaphor he was to use frequently. Such a mapping was necessary to promote international cooperation and to avoid duplication in research. To understand what contributions bibliography could make, an historical examination of the development of bibliography and a study of its current status were necessary. For Otlet a complete catalogue of sources, "the materials" of a field, was a first desideratum. If a catalogue were to be developed on cards and arranged in classified order, then achieving the important objectives

4. Derek J. de Sola Price, *Science Since Babylon*, new ed; New Haven, Conn.: Yale University Press, 1961.

of collective work, currency, immediate access both to what had been done and what was being done, became possible along with sensible planning for future developments. But beyond this, other bibliographic processes had to be introduced. He concluded that what was needed at the outset as a basis for subsequent bibliographical development was "a very systematic and a very detailed synoptic outline of knowledge."

Otlet and his colleagues studied literature proliferation and its social and institutional consequences in considerable depth. They hoped to create a system of intellectual statistics that would allow these phenomena to be monitored and mechanisms of bibliographic control to be introduced in a planned way.⁵ While it was not until the advent of UNESCO's *Statistical Yearbook* that some of these figures began to be assembled internationally on a regular basis, it did not take Otlet long to become clear in his own mind as to where potential solutions to problems of organising access to and facilitating the use of knowledge were to be found. For him these solutions lay in technology, bibliographic or "documentary" standards and the creation of a hierarchy of organisational arrangements of ever-increasing generality. These arrangements embraced methods of printing and publication, the work of international associations, bibliographic procedures, the restructuring of libraries and library systems to constitute part of an international communications network, and the coordination of libraries, archives and museums as information resources within this network.

Otlet's ideas on these matters provided him with the basis for an attempt to conceptualise and develop a new field of study and research, which as early as 1903 he took to calling "documentation." He suggested that documentation should be concerned not only with written and graphic records but objects as well because they had a "documentary" value. Of interest was anything that could convey potentially useful information no matter what form it took. He was led to envisage a form of documentary organisation whose levels and processes would ensure the provision of information through revolutionary information services or "offices of documentation". These would draw as needed on text, image, or object as sources of information and, linked together by common methods, shared tasks and formal agreements, their existence would transform libraries into stations in an information network reaching around the world. Their essential business, closely co-ordinated with archives and museums, would be information derived from all the immense variety of printed and other sources that were available. New documentary techniques and new kinds of documentary tools would be brought together in these offices in order to provide rapid, effective "consultation", which Otlet identified as a new information function for which new kinds of provision were needed. In effect these offices of documentation would become a new form of encyclopedia in which movement from bibliography to document to re-structured, re-codified knowledge would be made possible.

These ideas grew out of and, in a process of reciprocal interaction, were embodied in and tested against a series of actual institutional developments in Brussels. First was the creation of what might be described as a vast, cooperatively elaborated database. Initially this was bibliographical, the Universal Bibliographic Repertory. It grew from about 400,000 entries in 1895 to 3,000,000 entries in 1903 to 11,000,000 by the outbreak of War in 1914.

5. See Paul Otlet's own studies in 1899 and 1901, for example. Most important, however, is B. Irwinski, *La Statistique internationale des imprimés: IIB Publication No. 109; Bruxelles, OIB, 1911* (also published in *IIB Bulletin* 16(1911): 1-39)

Very quickly it was given a full-text and "image" or iconographic dimension in the form of a parallel Universal Iconographic Repertory and the prototype of a new kind of "encyclopedia", an Encyclopedic Repertory of Dossiers (or files). The physical ordering of these databases and the provision of access to their contents were handled by what was in effect a highly sophisticated software package. This has gone through many revisions and upgrades in most of the major languages, at least of the Western world, since its original release in 1896, and is still in use. It is the Universal Decimal Classification. The first edition of UDC in its new form, as developed from Melvil Dewey's Decimal Classification by Otlet and his colleagues, was issued in the period 1904-1907 in a volume over 2,000 pages in length. It was the first of what are now called faceted classifications and a complex apparatus for number compounding and subject specification (see papers 3 and 4 in this volume) was devised for it.

An international organisation was created in 1895 among other things to sponsor the database, coordinate the development of the software and provide a commercial search service based on them (See Paper 2 in this volume). The International Institute of Bibliography (IIB) became the International Institute of Documentation in 1931, the International Federation for Documentation in 1937 and is today known as the International Federation for Information and Documentation, FID. The Headquarters of the IIB, an International Office of Bibliography (OIB), was supported from its foundation as a quasi official agency by the Belgian government, a link that was not fully severed until 1980.

As new services and publishing initiatives were begun at the International Office of Bibliography in the period after 1905, a more general organisation was created around them. The Union of International Associations or UIA was formally created in 1910 after a great World Congress of International Associations. At the enlarged centre supported by the UIA, an International Library, an International Museum, an International University and a Central Service for International Associations were set up beside the documentary services of the IIB (See paper No. 9). After the War, all of these services, institutes and offices comprising what Otlet dubbed the Palais Mondial, later the Mundaneum, were transferred by the Belgian Government at considerable expense (500,000 francs) to the Palais du Cinquantenaire.⁶ Eventually these locations became the subject of considerable dispute between the UIA and the Government which resumed parts of them temporarily in 1922, most of them temporarily in 1924 and eventually closed the Palais Mondial entirely in 1934. This was by no means final and in 1939 the government agreed to make the locations available once again, but the outbreak of War prevented the resumption of occupancy. The collections were transferred to an old anatomy building of the Université Libre de Bruxelles on the edge of the Parc Léopold. Here, in the Rue Maelbeek, the Mundaneum was set up again and functioned, in an extremely circumscribed way, beyond Otlet's death in 1944.⁷

The UIA, effectively moribund after 1924, was revived after World War II and continues to perform important work especially as publisher of the *Yearbook of International Organizations*, a huge and now indispensable reference work continuing the *Annuaire de la*

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6. All of these developments are dealt with in some detail in W. Boyd Rayward, *The Universe of Information...* Moscow: VINTTI, 1975.
 7. It was here that the Editor was able to consult the archives and other records of the IIB for his biographical study of Otlet. He has described the richness of the sources and the picturesque but heart breaking disorder and decay in the locations in his "The Times of Their Lives: A Personal Reflection on Biography and History" Proceedings of the Fourth Library History Seminar...Clayton, Vic.: Monash University, 1990 (in press).

Vie Internationale that had been published in 1909 and 1911 under the auspices of the international centre in Brussels. The IIB, on the other hand, was re-constituted in 1924 and gradually took on a separate life under its English President, A.F.C. Pollard in 1928-1929. It was revitalised also in part by the energy and commitment of a third Secretary-General after 1928, the Dutchman, Frits Donker Duyvis, who brought it successfully through the Second World War. Under these influences it became independent of the Palais Mondial and what had become the somewhat stifling influence of Otlet and was to function actively and effectively until the interruption of the Second World War.

Otlet's legacy to his posterity is complex. He bequeathed us international associations that have successfully adapted to changing times and needs, and continue to exist - the FID and the UIA, responsible respectively for major bibliographical products developed by Otlet and his colleagues, the UDC and the *Yearbook of International Organizations*. The contemporary failure of other organisations, presumably to some extent at the time misconceived and maladaptive, is of great interest to the historian, as are the adumbrations of the functions of a number of modern organisations that show no obvious influence but conceptually are related to initiatives Otlet and his colleagues took in the first part of the century. The work of the International Institute of Bibliography in aiming to develop and coordinate indexing and abstracting services internationally, essentially through what was at the time called the *Bibliographia Universalis*, is paralleled today by the input plan and other work of the International Council for Scientific and Technical Information (ICSTI), previously known as the International Council of Scientific Unions Abstracting Board. There may well be an irony here in that, when the International Council of Scientific Unions was established in 1919, Otlet secured approval for the creation as part of it of an International Union for Documentation whose Statutes were actually drawn up. For reasons that are obscure, nothing further came of this initiative. Otlet's aspirations for a world network of cooperative bibliographic and information services are echoed in the General Information Programme of UNESCO. Insofar as he also dealt with the need for compiling official national bibliographies according to internationally adopted standards in a way that would facilitate the international exchange of bibliographic data (see paper No. 7), he was anticipating aspects of the programme for Universal Bibliographic Control (UBC) of the International Federation of Library Associations (IFLA). IFLA's headquarters in another of those ironies of history is now located in the Dutch national library just down the hall from the FID Office but the modern programmes of the two organisations are essentially uncoordinated and unrelated.

The work of the UIA in attempting to provide an international framework for intellectual relations was an important influence on the League of Nations in setting up its own general organisation for that purpose. This was the direct forerunner of UNESCO. Both FID and UIA are now affiliated with UNESCO in ways that Otlet, though he failed miserably at the time, had attempted to achieve for them with the League of Nations.

Another legacy is what remains of the much disturbed collections that were so painstakingly developed in the OIB and the Palais Mondial. The OIB, a semi-governmental instrumentality, continued to exist legally until 1980 when its collections as they were then understood to be, essentially what remained of the Universal Bibliographic Repertory, were transferred to the Belgian national library, the Bibliothèque Royale Albert I^{er}. The other collections were considered to be vested in Les Amis du Palais Mondial, a group of disciples and volunteers that had been incorporated in 1930 to protect the interests of the Palais

Mondial and to work among its collections. The remainder of these collections were transferred by Royal decree in 1985 to the Centre de la Lecture publique de la Communauté française (CLPCF) in Liège. Essentially here were what remained of the International Library, the collections of the Musée de la Presse, the files of the Encyclopedic Repertory of Dossiers and the Iconographic Repertory, and above all the archives of the Institute and the personal papers of Otlet and La Fontaine. Thus did the door finally close on the enterprises that the two friends had begun so hopefully in 1895 and which had lingered on for over forty years after their deaths!⁸

The final aspect of Otlet's legacy, however, is a body of writing for which a bibliography is provided in this volume. For his posterity the ideas represented in his writing have a particular interest both in themselves as statements of aspiration and of interesting and important insights, but also as statements in some sense embodied in and tested against organisational realities in a way that is perhaps unique, though little remains physically of these "experiments".

His ideas need to be understood in their "organisational" and historical context. His mind was very strongly shaped by the traditions of late 19th Century evolutionary positivist thought. He saw unceasing generalising processes of organisation at work. In the political and social world these processes were precipitating new kinds of institutions and relationships. In the intellectual world of ideas, they were shaping the growth of knowledge. He brought this frame of mind to his thinking about problems of documentation and international organisation. It led him to formulate the arguments of his papers and books in a particular way. A preliminary statement would be examined against historical developments. These would seem to suggest evolutionary goals that he would express in very general terms, often as prescriptively formulated desiderata or requirements. That these were plausible and not unrealistically grandiose or theoretical would then be suggested by an examination of recent developments.

His "philosophical" background also determined his somewhat mechanistic view of knowledge and of the document; he seemed to consider the latter capable of being shelled of its bits of information rather like a bag of peas. But this approach is not unrelated to that required for information processing by computer.

Indeed, this view of knowledge led Otlet to formulate what he called the "Monographic Principle" according to which separate items of information were to be recorded separately or "analytically" to use his term. The use of cards, generalised later to include the loose sheet or leaf as well, permitted continuous intercalation and international cooperation in creating the various databases that he and his colleagues attempted to set up in the International Office of Bibliography. The use of the minute subject divisions of the UDC helped to define and relate subject headings where entries either for bibliographic references or for actual information would be placed. Moreover the indexing of materials to be included in the bibliographic database on the one hand or the "partitioning" of documents to be

8. It is very much to be hoped that the plans of the CLPCF for the creation of an Espace Mundaneum in Brussels - or in any other centre - will come to fruition. The archives, papers and other "documents" that have been rescued but, after decades of neglect, are continuing to deteriorate further in inadequate storage, are of enormous historical and cultural value for scholars of the international movement, Belgian social history, and an enormous range and variety of other subjects, organisations and persons that the UIA and IIB and their personnel were associated with around the world but particularly in Europe over a fifty year period. That these resources of research are currently unavailable is a serious hindrance to scholarship and one hopes that the Belgian authorities will be able to find a way to make them effectively available again.

included in the encyclopedic repertoires according to the "monographic principle" on the other, could be at any level of detail: the whole document, chapters, sections and so on, down to "facts" which the indexing procedure would "detach" from the text of a document. The subsequent manipulation of cards and sheets, their organisation and re-organisation led him to envisage the reconstitution of knowledge contained in documents in a flexible encyclopedic way - what he called "codification". Hence Otlet's recurrent images of "mapping" knowledge, of dissecting or disintegrating documents and re-constituting them, of creating a minutely detailed table of contents and index of the "Universal Book of Knowledge", as well as an institutional expression of that "book" as a new form of "Encyclopedia."

This highlights two aspects of Otlet's work that are of particular relevance today: his anticipation of computer processing of text and his imaginative extrapolation from the hints provided by the technology of his own day, to a vision of the revolutionary changes a more sophisticated technology could make in improving access to and use of knowledge. Indeed, it is possible to claim that what he had himself discovered in 1895 was a new technology based on the standard card and loose-leaf or sheet, permitting mass storage of information, and a procedure for sorting and retrieving all that was stored: basic functions of computer processing. He had found a way to transcend the limitations that inevitably arose from the existing technology for communicating knowledge - using the printing press to produce separate, physically unrelated units such as books or issues of journals or periodicals. Cards and loose-leaves or sheets of a standard format led him to conceive of a new kind of book and file and catalogue that was infinitely and continuously expandable. The UDC with its complex system of encoding subjects ordered this file for searching. Ostensibly it also allowed for precise, flexibly formulated search statements. Search parameters could be set for point of view, date or language, and the other common sub-divisions, for example. The use of the + and : signs for establishing conjunctive relationships between separate subjects could be construed as functioning like the Boolean operator "and." The database, the file of cards or loose-leaves and later microfilm strips or microfiche, indexed by the same system, could be sorted against these statements and matches retrieved - either bibliographical entries or actual text.

While on-demand searches were made in the Universal Bibliographic Repertory from its beginnings until it became unavailable in the early 1970s, the theory and the practice were from the start at odds. The RBU was in fact subject to the same limitations as manual searching of any card catalogue or indexed "paper-based" file. First there was the problem that the sorting/matching process was limited by the need for pre-coordination in indexing. The classificatory machinery by which highly sophisticated subject specification became possible was not available for searching - the number elements of the UDC were not in fact entirely reversible, nor were multiple entries automatically made in the Repertory to take advantage of those that were. In addition the contents of the "documents", the facts and so on that were identified as needing to be made separately available on the basis of the "monographic principle," had to be physically extracted from the document itself either by laborious manuscript transcription or by cutting and pasting. This destroyed the integrity of the original and the possibility of other kinds of analysis, manipulation and reconstitution of the text that had not initially been anticipated. In machine-readable form, however, the integrity of the original record or document can be maintained or restored while its content

can be manipulated at any time in any way that the available software and the ingenuity of the operator allow.

Otlet's imagination was fired by the possibility of having text available in a form in which it could be searched, analysed, abstracted and re-formatted at will. His "monographic principle" and the "deep" indexing it implied by freeing the content of a work from the work itself, were thought to allow individuals to identify what I have referred to as atoms of information that could be re-configured in any way corresponding to their own particular interests and needs. But here arose a problem of communication and of storage. How to gain access to these elements, how to retrieve and copy them and how to store the copy locally for personal use become important questions. In thinking about these matters, Otlet effectively described what is now called the Scholar's Work-Station in which these and related functions are - or will be - carried out electronically, though Otlet's description of them was of course in terms of the technology of his time.

In a striking passage not two full pages in length in his *Traité de Documentation* he discusses machines not yet invented but which he believes were necessary if certain requirements for access to and use of information were to be met.⁹ He speculates about new forms of printing and about creating new kinds of machines for photocopying, even pocket-sized personal copiers. He wonders about creating illustrations from previously established basic units of design (a process similar to modern computer-aided design). Aware of the Hollerith "statistical" machines in use in the Bureau of the Census in Washington (see paper 12 in this volume), he considered the applicability of punched card machines and techniques to the sorting and retrieval of documents. He believed that a machine was needed to translate voice to writing and vice versa. A "telereading" machine would allow text to be read at a distance, while a "telescription" machine would allow the transmission of writing for addition to remotely held texts without having physically to disturb the originals. He believed that somehow it should be possible for scholars on their screens at home to read documents held at a distance in the great depositories (of course reorganised along the lines that he saw as necessary!), to which they would be linked by wire, like a telephone, or not by wire, like the radio and newly introduced television. Later in the *Traité de Documentation* he also speculated, in what he described as a way that would appeal to H.G. Wells (p.428), that perhaps the work-desk of the future might consist only of a screen or multiple screens and a telephone to call up documents automatically on the screen for consultation, along with some kind of "loud - speaker" for the transmission of sound when this was needed to augment the visual display.

These machines as a whole constituted a kind of auxiliary intellectual apparatus of contemporary scholarship. He believed that a new work environment would become necessary in which these machines could be brought together physically, their functions coordinated, their size reduced; ultimately they would be fused into a single machine. Within this new workroom there would be new kinds of desks or work tables both to accommodate the new technology but also new approaches to scholarly work that would now be possible. Desks would have different writing surfaces for different projects (perhaps like electronic windows) from which relevant documentation could be kept accessible and undisturbed. For storage and retrieval of documents in general, Otlet suggested that there should be a great mobile filing cabinet mounted on a straight or circular rail next to or around the desk and

9. Otlet, *Traité de Documentation...* pp. 389-391.

controlled electrically: a physical surrogate if ever there was one for electronically stored files and a database management system.

In this connection one should also stress Otlet's concern for the storage possibilities of microfilm (See papers 6 and 15 in this volume). Otlet believed that microfilm could be used to bring within reach of every scholar vast quantities of information either in the form of copies of existing catalogues and libraries of books, music, images etc or in the form of reconstituted information comprising a new approach to the Encyclopedia - what he was to call the *Encyclopédia Microphotica Mundaneum*.

While Otlet's casual reference to Wells is merely to highlight his sense of the science fiction-like character of his own speculations, it should be noted that Otlet's ideas for a new kind of encyclopedia and for a world documentary network preceded by several decades Wells's own statements about a "World Encyclopaedia" as discussed in *The Work, Wealth and Happiness of Mankind* in 1931 and in the papers published as *World Brain* in 1938.¹⁰ The two men were star "performers" at the Paris World Congress of Universal Documentation sponsored in 1937 in part by the League of Nations Organisation for International Intellectual Cooperation. It was as a result of this Congress that the name, International Federation for Documentation, was adopted for what had become the International Institute for Documentation. It is not clear if Wells and Otlet actually met on this occasion or ever became aware of the close kinship of their ideas for organising access to knowledge internationally.¹¹

It also seems clear that Otlet anticipated the kinds of organisation and technology that were to inspire Vannevar Bush's "Memex".¹² In the "monographic principle" and the idea of the reconstitution of documents, moreover, is a hint - but only very remotely a hint - of the associative and relational trails that each scholar would establish amongst the sources of interest to him. Thus, Otlet's notion of a mechanical brain, a substratum of memory, an external mechanism and instrument of the mind are anticipations of the functions foreseen by Bush for his Memex. Other work, such as that of Douglas C. Engelbart¹³ and the development of the currently fashionable hypertext systems, may also be considered in broad outline and functionality as having been anticipated by Otlet. In this connection it is not irrelevant to note that, in following his notions of "documentation" to their ultimate conclusion, Otlet was to speak of "Hyper Documentation" in terms only slightly more extravagant than those used by hypertext enthusiasts.

One can make too much of these anticipations. They are the speculative culmination of his extensive (and repetitive) analysis of the nature of documents and of organisational requirements needed to facilitate access to the knowledge that was their freight. In the long run what is perhaps most important in Otlet's thought is his comprehensiveness of approach, his extraordinary *vue d'ensemble*. He conceptualised a field of a study and research that is concerned not with separate institutions but with the related functions that a number of different kinds of institutions perform. Thus he sees bibliography, libraries, archives, museums and a new kind of institutionalised "encyclopedia" all as expressing functions that

10. H.G. Wells, *World Brain*. Garden City, N.Y.: Doubleday, Doran and Co., 1938.

11. W. Boyd Rayward, "The International Exposition and the World Documentation Congress, Paris, 1937" *The Library Quarterly* 53 (July 1983): 254-268.

12. Vannevar Bush, "As We May Think" *Atlantic Monthly* 176(1945): 101-108.

13. Douglas C. Englebart "A Conceptual Framework for the Augmentation of Man's Intellect," in *Vistas in Information Handling* edited by Paul Howerton. 1 (1963) 11-29.

have devolved upon "the document." But the document Otlet also conceives of in a new way as being anything conveying information, principally written documents of all kinds but also "things" as well, depending upon the uses to which conceptually they were put. This notion helps produce a coherence and amplitude to what in the English-speaking world are still fairly circumscribed areas of study, research and professional education, though broadened in recent years as information science or information management. Thus for Otlet the document is at the centre of a complex process of communication, of the cumulation and transmission of knowledge, of the creation and evolution of institutions. It is in this breadth, this sense of a whole, this catholicity of approach that Otlet has most to offer us.¹⁴ It is this that it is hoped the papers presented below will bring before a new generation of readers.

14. In this respect see W. Boyd Rayward, "Library and Information Sciences: Disciplinary Differentiation, Competition and Convergence" in *The Study of Information: Interdisciplinary Messages*. Edited by Fritz Machlup and Una Mansfield. New York: John Wiley and sons, 1983. pp 343 - 363, and also Rayward, "Library and Information Science: An Historical Perspective," *Journal of Library History* 20(1985): 120-136.

1. SOMETHING ABOUT BIBLIOGRAPHY¹

The debasement of all kinds of publication resulting from the modern cultivation of the so-called moral, social and political sciences is alarming to those who are concerned about quality rather than quantity. What is original in all of these books, brochures, and journal articles, the publication of which is announced each week in publishers' catalogues and in reviews in specialist periodicals? What allowances must be made for style and repetition and what is really new?

A delicate but necessary question.

If one spends a very little time reading these works, it seems that everything has been said, that everything to be said is known and that further reading is pointless. This belief has a companion state of scepticism, the consequences of which are deplorable. Seeing that so much is based only on opinion, one is constrained to believe that the *pros* and *cons* of any question can be sustained equally well and that the facts are too complex to be captured by any kind of conceptual formula, for these are always too exclusive and too tyrannical.

It follows that the social sciences are seen to those interested in them not as one discipline in terms of their materials and conclusions, but as a gathering of personal opinions based on documents collected more or less without order and method.

Close to us, however, rises the great monument of the natural sciences. The views of natural scientists on the constitution of man and the world, on the laws of their organisation and development, are no less extensive or less imaginative than those of economists and sociologists on society. But the difference between them is that in the natural sciences speculation and interpretation are secondary and are hardly ever made *a priori*. Natural scientists are not content simply to declare themselves positivist as a turn of phrase, as most of our popularisers do, and then to act as if positivist methods did not exist and ought not be applied everywhere and always.

The results of the natural sciences are grounded in millions of carefully observed, analysed, and catalogued facts. These facts have subsequently been integrated into sequences and the combination of these sequences has naturally led to the enunciation of laws, partial at first, general later, from which the most powerful and indestructible synthesis that has ever been made now seems possible.

There is no doubt that the methods of natural scientists are admirable. These scholars have made the rigorous application of such methods, invented or improved upon as need arose, the very condition of their work. Ingenious brains have always been found at the right time to invent the new research instruments and demonstration methods needed for the progress of science.

But all of this equipment would have been worth little in terms of its final result if all the natural scientists in all parts of the civilized world, no matter what their

numbers, had not worked toward the completion of the same task, the construction of the same edifice the broad outline of whose design has been impressed upon each one of them. Never has their activity been better co-ordinated. Never has there been less duplication. It seems that at any moment they are always aware of the present status of their science, that they never have to work in vain, discovering without realizing it what was already known. Moreover, each of their discoveries, each new contribution to the advancement of their science, seems to be recorded immediately and to become for everyone the point of departure for future research. Thus does an admirable coherence of work exist among chemists, physicists, and biologists. The latest arrival among this army of investigators can immediately find a useful job to do without having to tarry long with already completed work.

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Is our own science, sociology - it is very much ours since Law is its highest expression and implies the whole of it - similar in any of its aspects?

It is rich in facts, even richer in perceptions and observations. The number of those cultivating it is enormous. It is the dominant preoccupation of many people. What does it need, therefore, to achieve the solid, gradual development of the natural sciences? Truly, very little, but that little is essential: more precision and rigour in the observation of facts and more conciseness in the formulation of problems; that is to say, reliable investigation and monitoring procedures and an appropriate method of classifying its materials.

Everything has been said about its methodology. The best minds have in particular shown clearly what the social sciences can expect from modern statistical methods. The reduction of all phenomena to rigorous numerical laws will give them that precision we have pointed out as a first requirement. Now, social facts are, *par excellence*, facts that can be enumerated, since their peculiar character, which differentiates them from facts related to individuals, lies precisely in their frequency and their number. But our intention here is not to attempt yet another exploration of the role of statistics and other sociological methods. Once facts are observed and recorded in publications, thus becoming an integral part of knowledge, we would simply like to find out if with a special classification it is possible eventually and naturally to group them into scientific laws. How can we attain for the social sciences the positive and documentary character of the natural sciences. How can all the efforts of individuals be made to contribute to the development of a definitive synthesis which is built up slowly from facts and is the result not of the speculations of a particular thinker but of the research of all?

What do the sociological sciences deal with, and, from our point of view, how does their object differ from that of the natural sciences? The sociological sciences deal with infinitely numerous and complex social phenomena which are observable in the most distant places on earth, and which require, in order to be understood, a knowledge of anterior facts from the domain of history that are not amenable to direct examination.

The chemist's whole universe is contained in the test tubes of his laboratory. The physicist experiments with natural forces which are the same in Europe, in India,

and in Australia. The dogs, pigeons, and rabbits needed for vivisection by physiologists are found in every latitude.

But social facts? They constitute groupings of which both the whole and its parts escape the wisest observer. Where else can one find more connections between phenomena, more reciprocal influences and effects? An appraisal of a social issue is valuable only in proportion to the number of elements which it takes into account. Judgments here are as complex as the matters judged. Any error in the statement of any one of them has immediate consequences for everything that has been deduced from it, thus multiplying the error almost to infinity.

In summary, on the one hand is the absolute necessity if we are to reach an exact statement of the least social law, of taking into account *all* of the social facts and of being aware of all of their relationships. On the other hand is the impossibility, no less absolute, of any one scholar by himself observing these facts, the greatest number of which have occurred in other times or in the theatre of other places. If this is so, one can appreciate the importance that the best minds are beginning to give to the joint organisation of work, to the division of research in order subsequently to bring together its best results.

Individual monographs, research on matters of detail, contributions to more general studies are multiplying, it is true, out of all proportion. But it is necessary that all of these individual works be registered and classified, so that anyone can retrieve them immediately in order to use them and to push ahead, to know at every moment what has been done and what remains to be done.

How little has been accomplished along these lines!

What could be easier for an explorer than to know precisely and instantly the areas towards which he must direct his investigations if he is to add some new territory to the known and explored world. To determine what the latest discoveries are, all he has to do is to open one of the great maps published by our geographical societies. What remains to be discovered is revealed to him by the latest evidence. Trusting in this guide, he can set out certain of not wasting his energies and resources in expeditions that have already been made and that are, therefore, pointless for the advancement of the science of geography.

Is it not rather similar with industrial discoveries? Each country has a patent office which registers every new invention and publishes a journal, which, day by day, keeps the industrial world abreast of progress. Would it be so difficult to achieve a similar registration of sociological data and concepts?

Our colleague, Charles Dejongh, in the last issue of *Palais*² has attempted to set down the outline of a common programme for the study of social questions. He has directed himself to the Conférences du Jeune Barreau throughout Belgium and to similar groups of foreign lawyers. He has asked each of them to select a specific topic in a great synoptic chart he has prepared, and to make an exhaustive study of this topic. All the materials for this would have to be gathered together and conclusions formulated by each section in as many reports as there were subdivisions in the chart.

A superb project, all the more admirable for being at the moment unrealizable! It is not necessary to stress the difficulty of obtaining national and international agreement between associations which are only incidentally concerned with the scientific study of social questions. Moreover, the arrangements for our colleague's project too

strongly imply that it is a programme that could be completed once and for all in one or two years of work. It seems to us that this is not correct.

Social questions are not of one time, but of all times. At any given period they are no more than the whole of the social *requirements* of the time. There will always be social questions, as there always have been. Hence, any collective work for their study must have something continuous about it, a flexible, simple, permanent organisation.

For the moment what is important in Charles Dejongh's project is his idea of collective work. More than ever this is the essence of contemporary research. It is important to direct individual efforts towards a single goal and to be careful not to waste anyone's time and energy. Not that it should be necessary to re-create for intellectual undertakings the vast factories industry has required for the production of goods. Here each person, without any regard for his tastes and aptitudes, is given a specific task to do. He patiently works away at one of a thousand nuts and bolts which will be used for an infinitely complex machine that perhaps he never sees complete. Modern scientific research requires too much initiative for such procedures to be appropriate to it. Everyone's freedom must be maintained. But this principle is in no way incompatible with a degree of co-ordination of effort.

Is it possible to achieve this co-ordination, not by imposing rules of work on anyone, but by creating collective works which, while above and beyond individual projects, use them, complete them, make their development easier? This is the question in a nutshell.

Let us examine the services which, in this context, bibliography could provide if it were more comprehensive.

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With some quite rare exceptions, bibliography until now has been restricted to the modest function of indicating sources. In the beginning it was the preoccupation of the bibliophile and the speculative ventures of the book trade. Subsequently, with the publication of the catalogues of our great public libraries, it became more scientific. It was easy to arrange books alphabetically by the names of authors. A few large subject divisions were also created but these were no more than literature, law, history, etc. Gradually, for their own use, librarians constructed catalogues intended to respond to readers' requests for information. The principle of arrangement of such catalogues was naturally classification by subject. It was necessary to know how to indicate immediately what works their library had on alcoholism, taxes, the history of the French Revolution, etc. Then authors began to adopt the habit of referring whenever they could to the sources they had used. Scholars also imitated the example of librarians. They created their own small bibliographical listings in which were recorded not only the resources of their own libraries but, culled from their reading, any bibliographical or other information which might be useful to them some day. They also began to refer to the collectors of detailed index cards, those who, because of their carefully arranged systems of drawers and pigeon-holes, in two hours could furnish material for a scholarly lecture on any subject with which they were familiar. Anyone with research to do went and knocked on their door, certain of coming away with hands full of references. Enormous trouble was thus avoided. Referral to the latest study to have appeared on a

subject did away with the need for ploughing through mountains of books and journals as a means of being brought up to date on it.

One came so far. One hardly went further. Indeed, sociology has not drawn from Bibliography all the advantages that the latter can offer. Here is a marvellous instrument of progress which is still very primitive but whose first results augur well for its future.

A first step towards collective work would be to approach systematically the classification of sources. What has already been written and thought provides, *par excellence*, the basic materials of the social sciences. It is, therefore, quite natural at the outset to make a systematic inventory of these sources - both historical and contemporary, a catalogue of books, brochures, and articles in journals and encyclopedias, arranged alphabetically by authors' names and systematically by subjects. This would be a catalogue whose publication could begin at once. It would fall into two series, the one retrospective, the other by means of periodical issues listing, month by month, all new publications. At the moment such a work has not yet been specifically undertaken for the benefit of the social sciences, though one can cite examples for the other disciplines. The *Index Medicus* [1] published in the United States, is a true catalogue of medical literature. *Caspars Directory of the American Book, news and stationery Trade, wholesale and retail* [2] has achieved on a large scale for all of the branches of American learning what the *Bulletin des sommaires*⁴ has undertaken on a more modest scale for France. Finally, in Germany, the *Allgemeine Bibliographie* [3] of Putkammer and Mühlbrecht and the *Sommaire périodique des revues de droit*[4] are periodical listings of legal books and periodicals.

Such catalogues of sources, however, would not be adequate for sociology. In fact, of what value are all these sources? What does the title of a book and the name of its author conceal? It is just as important to be familiar with a work as to know of its existence. Nowadays, every new work is sent for review to the editors of newspapers and journals. Special publication exist, such as *Polybiblion* [5], devoted exclusively to book reviewing. The discipline of law alone has *Themis*⁵ in Holland, the *Centralblatt für Rechtswissenschaft* [6] and the *Vierteljahresschrift für Gesetzegebung und Rechtswissenschaft* [7] in Germany, and the *Rivista internazionale per le scienze giuridiche* in Italy. This is enough to indicate the position, greater every day, that bibliography now assumes. There is in general, however, not much system to producing book reviews, and this is a hindrance. Fine phrases, uncritical praise and some scraps of ideas copied from chance openings of the book are often all that can be found in them.

[1] *Index Medicus*, a monthly classified record of the Current Medical Literature of the World. Compiled under the supervision of Dr. John S. Billings and Dr. Robert Fletcher; Boston, George S. Davis, Publisher.

[2] Caspars directory of the American Book, news and stationery Trade, wholesale and retail, by C.N. Caspar, Milwaukee, Wis., bookseller, New York, office of "the publishers' weekly".³

[3] *Allgemeine Bibliographie der Staats und Rechtswissenschaften*, Uebersicht der auf diesen Gebieten im deutschen und ausländischen Buchhandel erschienen Literatur. Jährlich 6 Doppelnummern.

[4] *Sommaire périodique des revues de droit*. Table mensuelle de tous les articles et études juridiques publiés dans les périodiques belges et étrangers. Bruxelles, Vve Larcier.

[5] *Polybiblion*. revue bibliographique universelle. I. Partie littéraire. II. Partie technique. Paris, 5, rue St. Simon.

[6] *Centralblatt für Rechtswissenschaft* herausgegeben von Dr von Kirchenheim. Berlin, Guttentag.

[7] *Kritische Vierteljahrsschrift für Gesetzegebung und Rechtswissenschaft* Herausg. von Bechman und Seydel. München, von Oldenburg.

Breaking with tradition, the editor of the interesting *Rivista per la scienze giuridiche* [8], Mr. E. Serafini, has resolved to have authors describe their books themselves. In a very few pages, two or three at most, they briefly present their findings and what it is in their work that merits attention. An essential point - the reviews are signed. It is to be hoped that empty phrases and flattery will henceforth appear grotesque and misplaced and will become rare.

Pushing on further with these ideas, cannot one imagine a book review which has been developed "scientifically" according to standardised procedures? It has been observed that the excellent idea adopted for legal digests of making a very short resumé of the contents of judicial decisions, at one time gave rise to grave abuses. Under the pretext of summarising a judgement in a few sentences, the annotators used the abstract to express their own opinions. Certain lawyers recognized this evil, denounced it and established systematic rules for the preparation of the abstracts. Since then, for most cases, one can dispense with reading all of a decision. Everyone's research has thus been reduced.

Nothing prevents the application of the rules for the preparation of an abstract to that of a review. While in the legal decision it is the principle that has been established which must be set forth, for the book it is the point of view or objective of the author along with his general conclusions, and these are nearly always indicated in the preface or the last chapter. The need for objectivity is the same in both cases. If textual extracts are important in the composition of abstracts, they will be even more so for reviews. All that is necessary is that, in the course of a careful reading, appropriate passages be intelligently underlined. These can be extracted later, so that, after a fashion, the authors are allowed to speak for themselves.

The *Société des sciences sociales et politiques* of Brussels, whose bibliographical section, directed by our colleague La Fontaine, is becoming ever more important, believed that it was possible to ask its members to collaborate in the preparation of bibliographical cards. Each person who asked to be associated with this work was given cards of the same format. The title of the book or of the periodical article, the name of the author, that of the publisher, the price, the year, the number of pages and a short summary were then to be added to the card. It soon became necessary to put a stop to this. Some limited themselves to transcribing the title using different words. Others prepared what were really critical articles and extended themselves immoderately. Good extracts, prepared according to the procedure outlined here - a procedure which would permit a copyist to undertake the greatest part of the task - would avoid these difficulties.

Indexes for books, brochures and articles, and objective reviews of everything that is published, are just one part of the programme that should be undertaken for the bibliography of the social sciences. As a matter of fact from the purely formal point of view one can break it down into the following elements: facts, interpretation of facts, statistics, sources. All of its materials are reducible to these four terms. The materials can then be brought together and re-arranged in particular categories which are no more than the various questions the discipline poses, answers to which are sought from the

[8] *Rivista internationale per le scienze giuridiche*. Directeur, M.E. Serafini, professor at the University of Macerata.

materials. All of these questions taken together, with their subdivisions and the answers provided for them, constitute the discipline.

The various parts of any book, periodical article, or lecture can be easily reduced to the different elements we have mentioned above. For written works a rearrangement of their contents not along the lines of the special plan of a particular book, but according to the genus and species appropriate to each element does not make for any loss of substance.

This systematic recording of facts, statistical data and interpretations of them in the final analysis will be work undertaken by only a few individuals: the creation of a kind of artificial brain by means of cards containing actual information or simply notes of references.

Such an undertaking is indubitably useful, for Knowledge merely comprises all observed facts and of all the likely hypotheses that have been formulated to explain these facts and reduce them to laws. The external make-up of a book, its format and the personality of its author are unimportant provided that its substance, its sources of information and its conclusions are preserved and can be made an integral part of the organisation of knowledge, an impersonal work created by the efforts of all. The ideal, from this point of view, would be to strip each article or each chapter in a book of whatever is a matter of fine language or repetition or padding and to collect separately on cards whatever is new and adds to knowledge. These cards, minutely subdivided, each one annotated as to the genus and species of the information they contain, because they are separate could then be accurately placed in a general alphabetical catalogue updated each day. One such winnowing to conserve the best grain is clearly only an ideal. What is possible in practice?

Much more than is generally believed. Let us instance, for example, the great encyclopedias whose publication is continued by quinquennial supplements or even bi-monthly supplements, as in the interesting case of the *Revue encyclopédique*⁶ which is the continuation of the great *Encyclopédie Larousse*.⁷

Let us note also as support for what collective undertakings can do to help individual research through good subject classification, the great law collections and the excellent system of monthly, annual and quinquennial supplements which legal digests publish in order to bring some order to accumulating material.

Finally, closer to our topic, both because of the actual nature of the subjects and the periodical nature of the publication of the material, are the great journals which have occasionally in themselves founded a whole discipline. Who can say, for example, what is the role of the *Journal du droit international privé*⁸ in the development of this aspect of law? The *Archives de l'anthropologie criminelle* of Lacassagne contains the elements of a complete encyclopedia on this subject⁹; and there is no important philosophical matter of the last twenty years, which has not been mentioned in Ribot's review.¹⁰ The tables of contents of such periodicals provide the best catalogues of sources which are available today.

The programme we are proposing for sociology is, therefore, not unrealisable *a priori*. Without going into too many details, let us indicate some ways of helping to carry it out.

Unlike dictionaries, for which an alphabetical arrangement is still adopted, the general catalogue of the social sciences of which we are speaking will be prepared on

separate cards, thus allowing for all the manipulations of classification and continuous interfiling. This system is the only one which can be reconciled with the necessities of collective bibliographic work as we conceive it, because it alone permits the formation of the catalogue from contributions coming in from everywhere.

Indeed, we think that the cards of the catalogue should not derive from a single publication, but on the contrary, from all publications, each one according to what it has to offer in its speciality. One would not subscribe to the repertory, but in every library or study it would be created from elements supplied *ad hoc* by just about everybody.

Because of the existence of this repertory, the typographical layout of the text of bibliographical journals would be arranged in such a way that they could be easily cut up for filing with cards on the same subjects. The format of the paper would be standard and only the recto would be printed on.

The tables of contents of scientific books are becoming more and more systematic and complete. When a work is large and when it has a general title, its table of contents is the best indicator of what it contains. In order to make up the great catalogues of sources of which we are speaking, it will be necessary to record these tables of contents on as many cards as there are chapters. This new use will in its turn bring about important typographical changes. Publishers will have the tables of contents printed separately for use in catalogues and editors of journals will follow their example. To follow up the resolutions taken at the last Congress of the Book¹¹, new national and international meetings will have to formulate general rules. Agreement will be reached on the essential elements for all tables of contents, the basis of Bibliography, just as other congresses have regulated the units of measurement and nomenclature of other sciences.

The great public libraries are the primary group interested in the catalogue of sources. Their cataloguing departments should assume a special task, which will differ according to country, and undertake to publish a certain number of cards, as M. Nizet has proposed in a recent brochure.¹² Finally, individuals and scientific societies must become more active as collaborators in this collective work.

The goal is to create in each country an association, or a section of an existing association, whose programme is the collection, verification and publication on cards of information today remaining unused in the bottom of boxes. These cards would rapidly enlarge the size of the catalogue.

In the April 27 issue of *Flandre judiciaire* Me. H. de Baets, our eminent colleague at Gand, has presented a model of an easy-to-prepare "reading note" which could be used to give a preliminary idea of the arrangements which we are proposing.¹³

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What remains to be discussed is the status of a subject or how easily to ascertain the point of development reached by any branch of knowledge. The famous *Summa* of Saint Thomas¹⁴ should be mentioned here as an example. It sets forth a complete exposition of all the questions which the philosophers of the Middle Ages posed and formulates an answer for each question according to the state of knowledge then. *Summae* are no longer possible. The *à priori* is too far in the past and the empirical method has not yet produced enough facts for us to attempt today a new and definitive synthesis.

Should we limit ourselves to the subject reports proposed by our colleague Dejongh? Really, we would have to begin again every six months. Moreover, it is not possible to make them an integral and daily part of the repertory that we have described. After all, the reasonable goal proposed here is that any one person should be able rapidly to find out, not all about a subject, but all about the branches into which it has been divided and about the work already done relative to these branches. What must be avoided are repetition and duplication because of ignorance of previous work.

We believe that a very systematic and very detailed synoptic outline of knowledge would have enormous advantages. It would briefly mention all the aspects of a science, either in the form of a set of questions or according to a careful arrangement of its nomenclature. The latter form would be better because of its conciseness and the influence that it would have on the creation of a scientific language *ne varietur* of which the Social Sciences are particularly in need. This nomenclature, which usage would soon shape and stabilise, could also be used for the classification of cards in the catalogue. It would thus permit the creation of very practical links between the catalogue and the Synoptic outline.

We will borrow a model from law, whose centuries-old language has nearly achieved the precision of the language of chemistry. A word in law not only evokes the object named in its concrete form, but also, by logical association, all the characteristics and attributes of the object in the same way that the formula for a compound expresses its relationships and quickly makes its elements evident. The classification of legal subjects has also achieved an extraordinary precision. We would like to offer as proof, along with the indexes of certain catalogues, the preparation of the *arguments* which precede the entries for decrees and judgments in legal digests. A gradation of five or six words can move from the more general, to the less general, to a particular fact. Each card of the catalogue that we are proposing also would have its own argument, the basis of its classification, and the terms of the argument would be the same as those of the synoptic outline.

The ideas which we have developed in the preceding pages in support of an organisation for a general bibliography of the social sciences have found a practical application in what has been recently attempted for mathematics. In 1889, the French Mathematical Society took the initiative in calling a congress to establish the basis for an international bibliography of mathematics.¹⁵

M. Maurice d'Ocagne [9], explained what it was hoped would be achieved, in these terms:

"The number of workers, and, as a necessary consequence, the number of publications needed to make known the fruits of their research, have grown considerably. Mathematical writings are increasing everywhere. Clearly, they are not all of the same degree of interest for the progress of the discipline; however, it is possible to find in the most modest of them the germ of some fruitful idea which ought not to be overlooked. Now, it is physically impossible, even for the largest and most gifted intelligence, to embrace such a quantity of matter. Hence, the necessity for an appropriate guide which will allow a searcher to find out rapidly what has been achieved here and now on a

[9] *Revue générale des sciences*, 20 mars 1891, p. 170. ¹⁶

particular point, and which will provide him with complete bibliographical references to this effect."

The congress was held in Paris on the 16th, 17th, 18th and 19th of July 1889, was presided over by M. Poincare,¹⁷ and took, among others, the following resolutions:

1. A bibliographical catalogue of mathematics whose purpose is to spare workers long and difficult searches should be published. This catalogue should contain the titles of papers on pure and applied mathematics published since 1800 up to 1889 inclusively, as well as works relative to the history of mathematics since 1600 up to 1889. Entries should be arranged not by author's names, but according to a logical subject order.
2. Every ten years a ten-year supplement will be published.
5. The Congress adopts the following classification for the Catalogue: The various headings will be arranged in a certain number of classes, subdivided into sub-classes, divisions, sections, and sub-sections. The classes will be designated by a capital letter assigned an exponent. The classes or sub-classes will be sub-divided into divisions designated by an Arabic numeral, the divisions into sections designated by a lower-case Roman letter and these can also be sub-divided into sub-sections indicated by a lower-case Greek letter. Thus, the sub-section of section b, which is part of the division 3 of sub-class L' would be written in this way in a rectangular frame:

L'3 b α.

8. The Congress resolves that the various periodicals devoted to mathematics should publish for their volumes a general table of contents that follows the classification adopted above. The Congress will be very grateful to the editors of these journals if they would assist the permanent commission as much as possible in the matter of this classification.
9. In order to facilitate the establishment of supplements devoted to works after 1889, the Congress resolves that each author should include after the title of his paper the notation defined in the 5th resolution; and that, if the author has neglected to do this, the editors of the various periodicals, or in their default, the editors of indexing services which analyze these works, should assume responsibility for it.

Following these resolutions, the Congress appointed a permanent international commission to carry out its decisions. This commission is connected with the Committee on Historical and Scientific Work of the Ministry for Public Instruction which has provided the financial support needed to produce the much hoped-for bibliography. Today, it is in the process of being carried out.¹⁸

Let us add that the Royal Society of London intends to bring together for each individual science and according to a systematic subject arrangement the references listed in alphabetical order by author's name in the eight volumes of its *Catalogue of Scientific Papers* (1800 to 1863 and 1863 to 1874).¹⁹

Such are a few of the ideas that come to mind when, after some investigation, we ponder what Bibliography and collective endeavour could achieve in advancing the social sciences.

Editor's Notes

1. "Un peu de bibliographie" appeared in *Palais, organe des Conférences du Jeune Barreau de Belgique*, in the volume for 1891-1892, pp. 254-271. Otlet is described as "Avocat à la Cour d'appel de Bruxelles (Councillor or Barrister in the Appellate Court of Brussels). The setting out of the text of this article has been slightly condensed by the editor. *Les Conférences du Jeune Barreau de Belgique* was a forum in which junior barristers practiced pleading and discussed legal and other questions of interest. There were sections in the major Belgian cities.
2. Charles de Jongh (1854-1932), an acquaintance of Otlet's, a brilliant barrister, later President of the Belgium Bar, was active in the foundation in 1894 of the Nouvelle Université de Bruxelles. In 1919 he became president of the Belgian legislative Council. The paper Otlet refers to was, "Le Jeune Barreau et les questions sociales" *Palais*, 1891-1892, pp. 125-130. The article was followed by a "Tableau pour servir à l'étude méthodique des questions sociales (Outline for use in the systematic study of sociological subjects)," pp. 131-137.
3. *Caspars Directory* is a most curious work. Its subtitle describes it as "comprising the Publishing, Subscription, Retail Book, Antiquarian, News, Map, Art, Music, Manufacturing, Jobbing and Retail Stationery, Blank Book and Paper Manufacturing Business, and General Jobbers in above lines; in the United States and Canada." To the name, name changes, partial address and so on of each firm listed is added an indication of "appropriate financial standing ... based on the latest commercial reports." Caspar notes which publishers issue trade lists or catalogues and whether these are reproduced in *The Publishers Trade List Annual*. Part VI, "Theory and Practice of the Book Trade and Kindred Branches" has a section of 20 pages of bibliographical publications subdivided by countries: America, British Empire (excluding Canada), German Empire, France, other Countries (Austria-Hungary, Belgium, Denmark, Holland, Italy, Norway, Russia and Poland, Scandinavia, Sweden, Spain and Portugal). There is a vocabulary of English, German, French, Italian, Polish, Latin (and some other language) terms, phrases, and abbreviations used in the trade (including musical terms). It is not clear why Otlet should cite this work or compare it with Limousin's indexing journal. The 1885 edition of Caspar's Directory contained less than 300 pages; the edition of 1889, no doubt that to which Otlet refers, contained more than 1300 pages.
4. *Bulletin des sommaires. Revue ... de la presse scientifique, politique, littéraire, artistique et financière*. This, which appeared with various changes of title and frequency from 1888 to 1903, was edited by C.M. Limousin. It indexed for "the curious intellectual" a large number of newspapers and about 140 journals. Each issue of the index was prefaced by a "causerie" or "chat" that gave a very personal tone to the whole enterprise. Entries were arranged under broad general headings with a multitude of specific sub-headings. In 1896 Limousin, having been an interested participant in the 1895 International Conference on Bibliography in Brussels, introduced the use of the Decimal Classification to organise and index entries. In one of his "chats" he explains his joy in the system, then the difficulties

of applying it and what needed to be done in a case like his ("Causerie - Préface: la Classification Scientifique," *Bulletin des sommaires* 8 (10 January 1896): 1).

5. *Themis; verzameling van bijdragen tot de kennis van het publiek en privaatrecht.* The Hague, vols. 1-99, 1839-1938. This amalgamated in 1939 with *Rechtsgeleerd magazijn* to form *Rechtsgeleerd Magazin Themis*.
6. *Revue encyclopédique: recueil documentaire universel et illustré publié sous la Direction de M. Georges Moreau* (Paris: Librairie Larousse). This was published from 1891 to 1900. The preface describes the Revue as founded on the basis of the *Grand Dictionnaire universel de P. Larousse* and was intended "To follow the contemporary scene step by step, to record, as it proceeds, all the facts worthy of being pointed out, and to collect, analyze and classify all the literature which could at any moment become the subject of research." It was illustrated and divided into three sections dealing with literature and fine arts, the moral and political sciences, and the pure and applied sciences. It had a separate Index-Journal, a combined index to the Revue and "dictionary" of current events with short articles on dates, events and happenings sufficient for brief reference for readers not needing to turn to the main work itself. It also contained a section of information related to the news of the day drawn from and referring to other sources so that it could serve as a kind of "newspapers" newspaper. It became *Revue universelle: recueil documentaire universel et illustré*, 1901-1905.
7. *Grand dictionnaire universel du XIX^e siècle, français, historique, géographique, mythologique, bibliographique, littéraire, artistique, scientifique, etc., par M. Pierre Larousse.* (Paris; Larousse et Boyer, 1866-1890). 17 vols.
8. *Journal du droit international privé* was published in Paris, in 41 volumes from 1874 to 1914. It became the *Journal du droit international* which is still issued.
9. *Archives d'anthropologie criminelle, de médecine légale et de psychologie normal et pathologique* was published in 29 volumes from 1886 to 1914. From 1886 to 1892 it was known as *Archives de l'anthropologie criminelle et des sciences pénales*. Alexandre Lacassagne (1843-1924), a French physician, was from 1880 Professor of Legal Medicine in the University of Lyon. He wrote several textbooks which went through a number of editions, other monographs, and numerous articles for the *Archives de l'anthropologie criminelle* and for the *Dictionnaire encyclopédique des sciences médicales*.
10. *Revue philosophique de la France et de l'étranger paraissant tous les mois* (Paris, Alcan). This was begun in 1876 and is still published, nowadays by Les Presses Universitaires de France. Théodule-Armand Ribot (1838-1916) was a psychologist who, attempting to introduce positivist ideas into psychology, stressed the need for observation and experimentation and the removal of the speculations of philosophy from the subject. Several of his works went through a number of editions and were translated into numerous languages.
11. Otlet probably refers here to the Conférence internationale du Livre held at Antwerp in August 1890 to celebrate the 300th anniversary of the death of Plantin. Nearly

200 person attended and questions such as format of books, their composition and conservation, the creation of national bibliographies, together with technical matters concerning booksellers, publishers and authors were discussed.

12. F. Nizet. *Notice sur les catalogues de bibliothèques publiques* (Bruxelles: Imprimerie Vanbuggenhouwt, 1887). This work went through three editions during 1887-1888. François-Joseph Nizet (1829-1899), Doctor of Law, Political and Social Sciences, and Philosophy and Letters, became a keeper in the Belgian Royal Library where he was in charge of the preparation of the library's alphabetic subject catalogue, problems of compilation and organisation of which his pamphlet described. It contains an interesting discussion of subject headings.
13. "Notes de lecture" *Flandre judiciaire* 40 (27 April 1892); 350-351. This article, which is unsigned (H. de Baets was co-editor of the journal), sets out an approach to recording systematically on a "reading card" notes drawn from works about legal cases. "By indicating classification terms and legislative dispositions, one prepares for the work of future editors of alphabetic catalogues or annotated codes. If this practice became more general, the collaboration of all in forming digests would be achieved....". The article gives the "fiche" with these details for a work she has just read and "begs our readers to send us similar cards which it is quite easy to make in studying any subject".
14. St. Thomas Aquinas's *Summa Theologica* is a compendium of brief, systematic statements of the main beliefs of Christian doctrine. It was the greatest of a number of medieval summae (syntheses or summations of knowledge) and was written between 1267-1273. It was organised in three parts (theology, God etc; human race, morality, mysticism and miracles etc; the Incarnate World, Christ, etc), all three being divided into "questions" and then "articles" in answer.
15. The congress was called Congrès international de bibliographie des sciences mathématiques.
16. Otlet refers here to Philibert-Maurice d'Ocagne (1862-1938), a distinguished mathematician and graduate of the famous Ecole Polytechnique. One of the originators of the scheme, he was secretary of the Commission for the Bibliography of Mathematics for a number of years.
17. Jules-Henri Poincaré (1854-1912) was also a graduate of the Ecole Polytechnique. He was attached to the Ministry of Public Works. His most distinguished professional work was as a teacher in the Ecole Polytechnique and as a professor in the Faculty of Sciences in Paris. He was elected to the Académie des Sciences in 1887 and his important contribution won several prizes in the Académie and internationally.
18. The organisational details, the conference resolutions and the classification are given in *Index du Répertoire bibliographique des sciences mathématiques* publié par la Commission permanente du Répertoire (Paris: Gauthier-Villars et fils, 1893). The article by d'Ocagne in the *Revue générale des sciences pures et appliquées* mentioned in Otlet's footnote is by way of being a progress report on overcoming

organisational and financial difficulties. The *Répertoire bibliographique des sciences mathématiques* appeared between 1894 and 1912 in the form of twenty series or batches of cards. Each batch contained 100 cards. Each card was slightly larger than the now standard 3" x 5" card and each was headed by a classification number in a black box as described in the conference resolution quoted by Otlet. The cards were arranged so that the longer side was vertical and each contained up to, though usually less than, 10 entries. The entries are models of the use of different type weights and faces to indicate the bibliographic structure of entries. Presumably the cards were interfiled as each batch arrived or each batch or series was bound as a small volume as was the case for the copy at the Center for Research Libraries in Chicago. The edition of the *Index du Répertoire bibliographique des sciences mathématiques* published in 1898 contained a list of the full titles of the journals indexed. The abbreviations used for these in the entries on the cards are uninterpretable by and large without reference to the *Index*. The first edition (also translated into Dutch) contained only introductory matter and the schedules of classification. A new edition of the *Index* appeared in 1908.

19. The first series of the *Catalogue of Scientific Papers* covered the period 1800 to 1863 in six volumes; a second series in two volumes covered the period 1864 to 1873; and a third series covering the period 1874 to 1883 was issued between 1891 and 1896. The catalogue for the whole of the nineteenth century was not completed until 1925. The problem of providing appropriate subject access to it was discussed continually from the beginning but was never satisfactorily solved. Certainly nothing came of the initiatives Otlet refers to though an incomplete subject index (3 volumes in 4), classified by the schedules adopted for the *International Catalogue of Scientific Literature* was eventually issued in 1908-1914 (See W. Boyd Rayward, "The Search for Subject Access to *The Catalogue of Scientific Papers*, 1800-1900")

2. CREATION OF A UNIVERSAL BIBLIOGRAPHIC REPERTORY: A PRELIMINARY NOTE¹

*Qui scit ubi scientia
habenti est proximus*

The subject of bibliography is on the agenda of a great many scientific congresses. This year it has been included in the programmes of the International Geographic Congress of London², the French Association for the Advancement of Science³, and the International Artistic and Literary Association⁴. The Royal Society of London was concerned with it last year⁵. Quite recently, it was discussed at the Royal Academy of Belgium.⁶

There is unanimous agreement on the usefulness and necessity of a universal bibliographic repertory. But as far as ways and means go, its practical organisation, few details have been provided up till now. Six years ago an examination of these questions was begun in Brussels by a group on whose initiative the International Office of Bibliography was founded. Their studies were experimental. The International Office of Bibliography, placed under the patronage of the Belgium government, has thus far classified 400,000 bibliographic notices dealing with the major areas of scholarship, most particularly law, statistics, political economy, philology and literature. It possesses techniques of demonstrated excellence.

The purpose of this note is to make known how this office is organised and functions and to show how the extension and generalization of its services would provide the best solution to the problem of a Universal Bibliographic Repertory.

In order to respond to all the requirements that have been identified, a Universal Bibliographic Repertory should meet the following conditions:

1. *It should be complete.* It should contain both the bibliography of the past and the present. It should also be able to keep up with future production. Its object should be the whole of human knowledge. Moreover, periodical articles, and the studies contained in the proceedings of academies, societies and congresses should be represented in it in the same way as books and brochures.

2. *The Repertory should be both by name and subject,* that is to say, it should be able to provide information rapidly and easily about the works of an author whose name is known, and about works which are on a particular subject by authors who are as yet unknown. The repertory should, therefore, be both alphabetic by authors' names and classified by subjects. It is necessary that related matters should be grouped so that the searchers can avoid the too numerous searches which result from the scattering of subjects.

3. The Bibliographic Repertory should exist in *multiple copies*. It is an instrument of study and research of which no intellectual centre should be deprived. Therefore it should not be too costly or its upkeep too complicated. It should also be possible to divide it up because various of its parts will have no interest for a great many people.

4. The Repertory should be both correct and concise, both in the information which it provides and in the way it classifies this information. Errors and omissions are inherent in all human works. They are inevitable in a work as considerable as a Universal Bibliographic Repertory. Any system that is adopted should permit the easy *correction of errors and omissions* without the general repertory being affected.

5. The Repertory should be made available promptly to researchers who have been calling for it for a number of years. This immediate realisation is only possible if the repertory is able to *use most of the bibliographic works that presently exist*, and if it can be made available in parts before being entirely completed.

6. The Repertory should also include a *listing of locations*. A great many books no longer exist other than in rare copies in a few fortunate libraries. It is important that a general compilation of the catalogues of individual libraries should be able promptly to inform any one who is doing special research where to go.

7. The Repertory should also become the basis for *Intellectual Statistics*. These statistics, begun no more than a few years ago, are of limited scope because of the lack of a precise and complete census. They bear on the number of books, the nationality of their authors, and their subjects.

8. Finally, the Repertory should eventually be able to be used to ensure that authors get better *legal protection* for their intellectual works.

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The experiments of the International Office of Bibliography have led to some rules that have enabled it to begin a Repertory which will meet satisfactorily all of these requirements.

This Repertory is indeed universal. Its entries deal with the whole of human knowledge and include articles from periodicals, contributions to the great compendia, and books and brochures. Entries are prepared in duplicate on separate cards. The first card is placed in an alphabetical repertory of authors' names, the second in a classified repertory. The cards in the classified repertory are arranged according to the *Decimal Classification*, adopted by the American Association of Librarians. This classification has three advantages. First, it provides for human knowledge a nomenclature which is stable and universal and can be expressed in an international language - that of numbers. It allows a standardised methodology to be used in classifying all bibliographies and preserves an exact agreement between classification in libraries and that of the bibliographic repertory. Finally, it provides an indefinite system of subject division and sub-division so that everything that is related is grouped together.

The Office of Bibliography is divided into sections which correspond to each of the branches of Knowledge and which are the responsibility of specialists. A central

section has the special duty of collecting and making a first check of materials to be indexed. Each of the sections annotates and then classifies the cards which concern it. The Repertory comprises old and new sources. Because of its system of cards and continuous intercalation a complete listing of intellectual production can be achieved. Current material is published periodically in special Bibliographical Indexes whose arrangement is identical to that of the repertory. Finally, in order to make the whole repertory - of past publications and current publications - available to researchers of all countries, the International Office foresees its continuous publication on separate cards which will be sent, completely annotated and classified, to local offices annexed to major libraries or universities.

Such is, in broad outline, the organisation of the repertory begun by the Office of Bibliography. We must now describe each of its elements in detail.

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The services to be expected from Bibliography are many. It should provide information for scholars, practical men, librarians, book-sellers, and the great reading public.

From the essentially scholarly point of view, a complete bibliography should constitute, at each moment, an encyclopedic table of contents of the subject matter of knowledge. What scholars quite reasonably wish to do is to pass from the known to the unknown, to make use of the work of all who have preceded them as they push scientific investigation further forward, avoiding unwitting repetition and loss of precious time. Especially today, scientific work has become specialized and international. Science progresses through the efforts of scholars from every country, with every kind of skill. Each brings to the common edifice the stone he himself has quarried. It is important, however, that this stone be trimmed to the dimensions of the place in which it must fit beside the others, and consequently that the state of development of the whole of the work should always be exactly and easily known.

Practical men have a similar need. For them it is a matter of easily finding out about a fact, a law, an invention of which they wish to make use. Technical dictionaries are inadequate for they are too soon outdated. As for the periodicals which are tending to replace them, they have become so many that it is no longer possible to use old procedures in consulting them. A universal bibliographic organisation will allow us to regard all that has been published regardless of place, time or form of printing as elements in an immense, theoretical, historical and practical encyclopedia for which the Repertory will become the table of contents.

Librarians, in their turn, clamour for the organisation of bibliography. Only the great libraries are able to afford the luxury of a complete cataloguing service. However, without a catalogue the library is a closed coffer, full of precious things that are invisible and inaccessible for want of a key. A Universal Bibliographic Repertory will do away with the need for individual catalogues which are of necessity incomplete. It will replace them by a single, always current catalogue, which will give readers information not only about the contents of the library they are working in, but about everything that is available beyond it in other libraries or commercially through the booktrade. Today, in thousands of libraries, men are working laboriously to list and classify the same books.

Each time a new collection is formed this work must be done again. Moreover, there are as many methods as individuals. Classification differs from country to country, from town to town, from library to library, requiring a new approach by the searcher to each new catalogue he consults. The Bibliographic Repertory, reproduced in many copies, will bring about standardisation of classification which is so much desired.

By means of division of work, a new body which is distinct from all the others will henceforth be especially entrusted with the classification of written documents. The classification must be developed by specialists and not, any more, by those of whom universal knowledge is demanded and to whom it is gratuitously attributed. Libraries will have a double benefit from this. They will be almost totally absolved from providing an extremely costly service. Henceforward they ought to be able to offer help directly in the research of the public who come to them, for they will be able to reply immediately to the question which is invariably put to them: "what works exist on such and such a subject?" The catalogues that each library prints at great expense, and which new accessions soon make out of date, can be replaced by the Repertory. Each library will note in the margin of the cards of the Repertory the works which it possesses and their shelf mark. The cards on which no such note appears will suggest the books which could be acquired for each subject.

Publishers, booksellers and authors themselves have everything to gain from the effective organisation of bibliography. The book trade needs above all accurate and rapidly and easily obtained information. The anarchic state of libraries today has its parallel in the book trade. Publishers' catalogues, apart from some happy exceptions, are prepared without order or method. Their compilation is guided by no shared understanding. Thus, they barely succeed in being useful to the readers for whom they are made, and the enormous sums spent in publicity each year for new works are less effective than need be. Supply and demand exist, of course, but independently of each other; they do not connect; publisher's announcements do not reach those who seek them. A Universal Bibliographic Repertory would assure publishers of prompt, serious, permanent and really effective advertising. To authors who, after all, write to be read, it will give assurance of reaching those whom they really wish to reach.

Librarians, scientists and practical men, authors and publishers, the great mass of ordinary readers, all have the greatest interest in the development of the Universal Bibliographic Repertory. Governments, themselves, cannot remain indifferent to it. Cannot they who, at great cost, manage museums and collections of every kind, encourage this collection which is more valuable than any: the inventory of what men have thought and written since they learned how to write?

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Happily - and too often one forgets it - not everything remains to be done in bibliography. Already there lies behind it a long history which simply consists of successive attempts to achieve a better organisation of the world of books.

The humanists of the 15th Century who carefully collected the remains of classical antiquity, were bibliographers in their way. Their glosses and annotations were used as indexes by the men of their time. In 1686, Teissier was already able to compile a catalogue of catalogues.⁷ Francesco Marucelli (1625-1703), in the 15 (sic) manuscript

volumes of his *Mare magnum*, strove to make an inventory of the extant writings of his day.⁸ He had numerous imitators: Fabiano Giustiniani,⁹ Georg Draud of Frankfurt,¹⁰ Savonarola,¹¹ the author of the *Orbis literarius*, a universal index in 40 manuscript volumes of all the existing printed works up to the end of the year 1700. Special bibliographies also made their appearance at that time. Martin Lipenius's *Bibliotheca realis juridica* (1679) was followed in the same year by *Bibliotheca realis medica*, then came his *Bibliotheca realis philosophica* in 1682, and the *Bibliotheca realis theologica* in 1685.¹²

With the 18th Century began the era of the great encyclopedias in which a bibliography of the subject was placed at the end of each article. This is also the period in which the first attempts at periodical indexing were made. In 1790, Beutler published in Germany the *Allgemeines Sachregister über die Wichtigsten deutschen Zeit- und Wochenschriften*.¹³ In England at about the same time, Ayscough published his *General Index to the Monthly Review*, the second volume of which appeared in 1786. It contained *An Alphabetical Index to all the memorable Passages, many of which relate to Discoveries and Improvements in the Sciences and Arts for near forty years past; With Literary Anecdotes, Critical Remarks, etc., etc., contained in the Monthly Review during that period.* The part of this gigantic work which appeared in 1796 comprised: *A General Index to the Remarkable Passages, and to the Papers contained in the Transactions or Memoirs of Societies, Foreign and Domestic, occurring in the Review during that Period*.¹⁴

With the 19th Century, bibliography became to some extent official. Some of the great States considered that it was their duty to register the literary production of their nations. The development of the great public libraries and the proclamation of the exclusive right of authors to the exploitation of their works, contributed almost everywhere to the publication of periodical bibliographies of which the *Bibliographie de la France* was one of the earliest models.¹⁵ These official bibliographies quickly duplicated the catalogues published from time to time by booksellers' associations. The general nature and poor arrangement of these publications soon gave birth to attempts at special quarterly or annual periodical bibliographies which indexed all the information related to a particular branch of knowledge, such as the *Bibliotheca philologica*, the *Bibliographia orientalis*, the *Zeitschrift für die Gesamte Medicin*, etc.¹⁶

The greatest bibliographical effort of the 19th Century, however, has been made by the Americans. Voluntary co-operation of librarians on the one hand and of booksellers on the other, has given birth to a series of admirable works to which are attached the names of Poole, Fletcher, Cutter, Dewey, Windsor, and many others. In 1850 in the United States, a new country without a history, there were about 100 libraries containing 5,000 volumes or more. The whole of their collections were judged to be 1 million volumes. In 1890, forty years later, four thousand libraries contained 27 million books. The question of catalogues, as we know, has gained attention in a quite special way. In 1848, Frederick Poole began to issue an *Index to Subjects Treated in Reviews and other Periodicals* which contained about 28,000 bibliographical entries. The American Library Association (ALA) was founded at Philadelphia in 1876 and in the following year reached an agreement with the Library Association of the United Kingdom in England to develop the *Co-operative Index to Periodical Literature*, to index and classify articles in English language periodicals from 1802. The first volume, in 80

with XXVII - 1442 pages, a listing of 200,000 articles in the 6,205 volumes of 232 periodicals, appeared in 1882. Fifty collaborators associated with libraries in the United States, England, Scotland, and Australia, had cooperated. The Americans did not stop at this point. Successive supplements to the *Co-operative Index* have been prepared.¹⁷ In 1886 a special section of the Association of Librarians was created for printing bibliographies.¹⁸ A journal, the *Library Journal*, has been specially devoted to the study of all matters of library economy.¹⁹ A special school, "Library School," organised at Albany under the sponsorship of the University of the State of New York, has offered young librarians the technical instruction they needed.²⁰ Finally, an office, the Library Bureau, has undertaken the practical and commercial arrangements for all the improvements to which the organisation of libraries is susceptible.²¹ Other large bibliographical works were also successfully completed by the Americans such as the medical bibliography in 16 large volumes compiled by Billings which has been continued by the monthly *Index Medicus*.²² There was also the *Alphabetical Index of Articles in the Smithsonian Contributions to Knowledge* by William J. Rhee.²³

We do not wish to provide a history here, even less a listing of bibliographical writings. Thus, we have limited ourselves to mentioning some of the different forms bibliography has taken today. Along these lines, we would also mention the great Bibliographies of Bibliographies of Petzhold and Léon Vallée (the latter has collected the titles of about 11,000 fragmentary bibliographies).²⁴ Attempts have also been made to list the publications of learned societies. J. Müller has done this in a very complete way for Germany.²⁵ General lists, such as those of Brunet²⁶ and Lorenz for France²⁷, and Heinzius for Germany,²⁸ cover all of a country's book production during a given period. The Royal Society of London has published a *Catalogue of Scientific Papers* in eight large volumes, an important international work but of limited usefulness because of its purely alphabetic arrangement.²⁹ The Astronomical Bibliography of Houzeau and Lancaster³⁰ smaller in size and scope, is superior to it in method. Let us also mention here the printing of the great catalogues undertaken by the Bibliothèque Nationale of Paris,³¹ which today contains about two and a half million books, and by the British Museum which has a million and a half.²² These catalogues, still incomplete, are truly great monuments to human thought.

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Bibliography has a glorious past behind it. It can be proud of the works to which it has given birth, and certainly, as we have said above, everything does not remain to be done. But the importance of its mission becomes increasingly clear as the grandeur of the results already achieved permits us to conceive of increasingly far-reaching plans. Bibliography has arrived at that stage in its development where, from now on, it is more important to organise its riches than to create more. Various partial attempts have been made in this sense.

Some great libraries, such as the Bibliothèque Nationale in Paris, the Königliche Bibliotek in Berlin, the British Museum in London have created true bibliographical sections by placing volumes related to bibliography together and putting them at the disposal of readers without the need for any preliminary request. Also by preparing up-

to-date card catalogues, these libraries partially satisfy the requirements of their public - but how incompletely still!

Some private, commercially organised agencies have undertaken to obtain for a fee particular information for those who request it from them. These agencies exist in several large cities and perform important services, but they must themselves undertake extensive, long, costly and necessarily incomplete searches. Bibliography, like the library which it complements, must become a free service.

International centres of scientific information related to special subjects have been proposed time and time again. Belgium is home for two such institutions - The International Colonial Institute and the Geologic Bureau.³³

In 1889, an International Congress of Mathematicians met in Paris in order to adopt an enormous scheme of mathematical bibliography.³⁴ The Congress agreed on an international classification whose elements are a combination of letters and numbers. It decided to publish a catalogue on separate cards which would permit successive intercalations. Since last November the Executive Committee of the Congress has regularly sent mathematicians of all countries packets of index cards, the filing of which is made extremely easy because the notation has been standardized.

The mathematical catalogue thus constituted has progressed considerably. The single regret that one might express here is that the editors have not been concerned enough with universal bibliography and that they have not regarded their work as a part of a greater whole. This consideration has been a dominant one for the Americans. Some years ago, the classification of their libraries was considerably standardized by the general adoption of the *Decimal Classification* invented by Melvil Dewey. More than 1,000 libraries in the United States have adopted this system. At the beginning of 1893 the government in Washington at its own cost printed a catalogue of 5,000 volumes selected from the best of those that could serve as a basic collection for public libraries. The catalogue, arranged according to the *Decimal Classification*, is a first and interesting attempt at bibliographic centralisation where the work is done by a few for the benefit of all. To certainty of technique, it adds all the advantages of economy.³⁵ Finally, quite recently we have learned that the American Library Association has just undertaken the publication on cards of the titles of all new publications in the English language. These cards, having very full entries and bearing the number of the *Decimal Classification*, are sent by subscription to libraries, to booksellers and to individuals. They are useful for setting up both catalogues and bibliographic repertoires. To us they constitute the greatest advance that has so far been made.³⁶

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Now studied in all countries and in all branches of knowledge, Bibliography has made considerable progress in this century. For want of sufficiently extensive agreement and co-operation, however, its development has been hindered. Unlike most of the sciences, it does not yet have either a common language or common units of classification which have been generally recognized and adopted. Nor has it succeeded in creating between individual works that coordination, advantageous in every way, that will be a result of the existence of the Universal Bibliographic Repertory.

Only an International Office of Bibliography can realize this double goal: the standardisation of classification and the co-ordination of individual efforts.

How to achieve standardisation in classification?

Because the enormous accumulation of printed materials has made classification necessary, different systems of classification have been suggested. They are of three main kinds. First, the titles of books are classified alphabetically by the author's name. This classification is inadequate from the bibliographical point of view because it supposes that the work one wants to consult on a subject is known in advance. It can only be used as a complement to classification by subject. This can be either a dictionary of principal headings (Stichwörter) under which are placed relevant items, or a classified arrangement under whose logical divisions these same items are grouped.

So far both forms have had their partisans. Alleged in favour of the dictionary form is ease of searching resulting from the numerous and precise references that can be introduced into such a catalogue by means of multiple entry. The very real inconvenience of the system, however, lies in the infinite scattering of subjects. To take only one example, whatever deals with "work" will be distributed under the widely separated headings: legislation about work, hours of work, accidents of work, contracts for work, hygiene of workshops, Workers' Associations. Another inconvenience appears in relation to international bibliography: alphabetical order is not the same in all languages and it is necessary to know a language well in order to be able to use the dictionary catalogue successfully. For these reasons logical classification of materials has been preferred by a great many authors.

But this does not avoid all difficulties. While logical classification has advantages because it groups similar and related matters, and while to a certain extent it is more international because it uses logic which is more international than language, it has been criticised by a great many bibliographers. It is too arbitrary and supposes a considerable knowledge of the ideas that went into its construction on the part of those who wish to use it. Moreover, the divisions and sub-divisions of a classification are generally expressed in headings very much more complex than those used in the dictionary form. From this arises difficulty and length of notation on the bibliographic cards and on the books themselves and the absence of any international language.

A recent form of classification combined the advantages of the two systems and avoided most of their disadvantages. The subjects were arranged according to a systematic order in which all the divisions and sub-divisions received a symbol that was equivalent and of the greatest possible conciseness - letters, numbers or combinations of letters and numbers. An alphabetical index completed this ingenious arrangement and listed all the words used in the system with their classification number opposite. If the third logical division of a subject (for example, "working hours" in a bibliography of economics) received the letter C, in the alphabetical index at "working hours" one would find, "See C."

The existence of this relatively practical system did not end the troubles of bibliographers. From the moment bibliographies began to be sub-divided a little (and this is unavoidable if they are to be of real service), the indices became indecipherable hieroglyphs which no larynx could successfully pronounce, such as, for example, -Djkm, -Zwr, or even worse, -Sy₃cd. The confusion became even greater because each author invented a particular system of standard signs without regard to those employed

by his predecessors and without any attention to those in use in the other branches of science. Authors who sought clarity more than anything else used numbers. To each division they gave a number drawn from a separate series. Though this was less complicated, once established the order was unchangeable. As soon as an error or an omission was noted, the harmony of the system was broken.

The Americans appear to us to have found a more nearly definitive solution to the problem. Indeed, it is to them that we owe the Decimal Classification, invented, as we have said, by Mr. Melvil Dewey, but adopted and popularised by the Association of Librarians of the United States and the Bureau of Education (Ministry of Public Instruction) in Washington. The principles of this classification have an inspired simplicity. All of human knowledge is divided into ten classes, to which corresponds one of the ten numerals, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9. Each class is subdivided into ten groups, each also represented by a numeral. Each group is, in its turn, divided into ten divisions expressed in the same way and so on. The ten classes are represented thus,

0. General works
1. Philosophy
2. Religion
3. Sociology
4. Philology
5. Sciences
6. Applied Sciences
7. Fine Arts
8. Literature
9. History

For the fifth class, for example, we have

5. Sciences
50. Sciences in general
51. Mathematics
52. Astronomy
53. Physics
530. Physics in general
531. Mechanics
532. Hydraulics
533. Gas
534. Acoustics
535. Optics
536. Heat
537. Electricity
538. Magnetism
539. Molecular Physics
54. Chemistry
55. Geology
56. Paleontology
57. Biology
58. Botany
59. Zoology

All the works concerning electricity are numbered 537. The first numeral, 5, indicates that the subject is related to the fifth class of human knowledge, that is to say, to science. The second numeral determines what division of science is in question. Here it is the third division to which, conventionally, the numeral 3 is given. All works in physics are, therefore, marked 53. But physics itself is broken into different sections, of which the seventh is electricity, according to a uniform, previously established classification. When the numeral 7 is added to the number 53 it individualises it and 537 indicates works which deal only with electricity. It becomes in this way a classification number (Class number). By limiting the number of parts in each division to a maximum of ten and by giving a standard number to each, Dewey has succeeded in pin-pointing the location of each subject, no matter how specific it may be, in the whole corpus of knowledge.

Indeed, the numerals which represent the classes and divisions of each subject come together in an extremely simple numerical expression: 537 in fact signifies nothing else but the fifth class, third section, seventh division. The links, the genealogy even, of ideas and objects, their relationships of dependence and subordination, of similarity and difference find suitable representation in the bibliographical expression formed in this way. This representation more or less excludes what is conventional and arbitrary. Not only does each numeral express in its particular way an essential idea, but the combination of numerals, that is to say their sequential ranking and their place in the whole number, follows the laws of scientific logic. In this sense they constitute a veritable new language whose phrases, here numbers, are formed according to constant syntactic rules from words, here numerals. It is a kind of agglutinative language: its numerals are its roots, predicative and attributive roots, purely verbal roots in the sense that they are not nouns, adjectives, or verbs. They are placed above and outside any grammatical category in that they express abstractions, pure scientific categories. Thus they translate ideas absolutely common to the entire scientific world and express them in universally understood signs - numbers. In this two-fold way, the *Decimal Classification* actually constitutes an international scientific language, a complete system for representing science which one day perhaps may bring help to intellectual workers analogous to that which they received from Latin in the Middle Ages and during the modern period.

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While this philological aspect of the Decimal Classification is not without importance, from our bibliographical point of view, we must emphasize the classification's other advantages.

In the first place, as we have already said, all related subjects are grouped together. An alphabetical index in one or more languages, containing all the headings that can be searched and all synonymous and related headings, completes the systematic tables. The simplicity with which the classification numbers are formed gives the system considerable mnemonic value.

Because the numerals, no matter how many of them there are, are simple to read and concise to write, they can be easily transcribed on each card of a catalogue, each

book in a library, and these can thus receive a permanent location. All the cards, all the books having the same classification numbers, will be located next to each other without the person responsible for arranging them having to be initiated into the special knowledge needed to classify the documents. Only indexers need to know this. Even their task is very much facilitated because they need only to open the alphabetic index at one of the key words in the title of the book to be indexed to find a classification number for it immediately.

The classification is called *Decimal* in that each number indicates a more or less strict division of a whole which is assumed to be "one." Of course, the various branches and sub-branches of the sciences can be divided into more or fewer divisions. When it is necessary to increase the number of categories, one can use numbers containing four, five or seven digits, even more. When, however, the subject cannot be broken up in this way, numbers with two or three divisions will be used. Because the numbers are arranged solely on the basis of their decimal importance, the number of digits making them up does not matter, and related subjects, however sub-divided they may be, remain grouped together.

Works about electricity, for example, are given the class number 537. Those dealing with chemistry the class number 54. If a classifier does not wish to establish categories among works of chemistry and if he numbers them uniformly 54, then in the arrangement either of cards in a repertory or of books in a library, 537 will come before 54 since in the numerical series five hundred and thirty seven thousandths comes before fifty four thousandths. Thus, to express it in a general way, all the numbers beginning with 5 come before the numbers beginning with 6; all the numbers beginning with 53 come before all of the numbers beginning 54; all the numbers beginning with 537 come before those beginning with 538, just as in a dictionary all the words beginning *Ab* precede those beginning with *Ac* and all the words beginning with *Aca* precede those beginning with *Acb*.

The *Decimal Classification*, therefore, permits an exact localization of subjects. It is not without analogy to the system of anthropometric identification conceived by M. Bertillon which is used in the great European capitals with general satisfaction.³⁷ It conforms to the essential principle of bibliographical order, as of all other kinds of order: a place for everything and everything in its place. It provides, moreover, a rational method of localization; this idea is the very essence of the system.

It is necessary, of course, to distinguish carefully scientific classification from bibliographic classification. The requirements of the two are not the same. All scientific classification is based on the definition of the objects to be classified, and this definition itself is finalised only when science itself has been fully developed. In the present state of the advancement of knowledge, a definitive classification *ne varietur* must be considered premature. If the finest minds are not even agreed on the most important points of a classification, how can one anticipate agreement on its details? Happily, this scholarly agreement is not necessary for a bibliographic classification. All that is necessary is a complete survey of the various subjects that are dealt with by the various branches of knowledge, a grouping of these subjects in the most generally accepted order, and finally, the determination of a fixed place for each of them. "To bibliography" is therefore, above all to label and provide a location for scientific materials.

A very complete, much studied, admirably simple classification in harmony with these views exists and has been applied for 17 years in America for the classification of books in libraries. The outline of this classification is complete and embraces the universe of knowledge. More than a hundred specialists have collaborated in developing and improving it so that by now it has about 10,000 main headings in the systematic tables and 22,000 words in the alphabetical index. This classification, moreover, can be developed indefinitely. It has, therefore, won the vote of the Office of Bibliography which proposes to use it as the basis for the Universal Bibliographical Repertory. Since what is important is a *complete and universally understood system of location*, it is necessary to adopt the *Decimal Classification* as a whole and to ask everyone to sacrifice his personal preferences in favour of the higher need for unity. The great and well deserved success which it has had in the United States and the lack of any bibliographical uniformity in Europe should put an end to any remaining hesitation [1].

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The International Office of Bibliography, therefore, possesses a system of classification whose excellence has been demonstrated by a first trial. To round out this system on which it has based its organisation, it has decided that all the bibliographical information it collects will be placed on separate cards. The principle of separate cards today needs no longer to be defended. They alone permit the maintenance of a permanent single order in the Repertory. Indeed, the Universal Bibliography is special in this, that it is built up continuously. It must register literary production as it comes to hand, hence repeated intercalations. On the other hand, the checking of older books will necessitate considerable work over a very long period. If the Repertory were to appear in book form, the fear of errors and omissions in such a considerable and definitive work would delay its publication indefinitely. The system of cards, on the contrary, allows small quantities of bibliographic materials to be issued even as and when they are prepared. Because a classification number on each card indicates its exact place in the Repertory, all the inconveniences inherent in this form of publication are avoided.

To the objections that catalogues on cards are difficult to make available to the public, who can disturb their arrangement, and that they have the inconvenience for the reader of giving only one piece of information at a time, Dr. Rudolph has made a triumphant reply by devising an ingenious piece of equipment whose description is as follows.

M. Rudolph inserts the cards, which he makes as small as possible, between two metal slides that are placed on the two sides of sheets of strong cardboard or very thin wood which thus constitute card-carriers. Each of these card-carriers is held to the others by means of easily detachable rods. They form, therefore, a kind of large book which resembles pretty closely the little albums in which photographs are pasted on a long band of cloth which folds up.

[1] In an appendix we give Specimens of the principal divisions of the *Decimal Classification* and of the detailed divisions for sociology [not reproduced here]. Complete translations in French, German and Italian are being prepared.³⁸

The card-carriers, each containing its bibliographical entries, are brought together end to end in an endless chain, and are placed in a wooden chest, about one metre in height, the upper part of which is made from glass. They rest there on two hexagonal drums which a crank turns backwards and forwards. The movement of the drums draws along the card-carriers which revolve under the glass. The chest is closed by a key: the public cannot touch the cards which it contains. The reader who desires information stands before the glass and turns the crank until the series of entries that he seeks appears. Four card-carriers, each able to contain 45 cards of three lines, appear for his inspection at the same time and thus give him all of the ease of reading a book. On the other hand, the advantages inherent in a card-system are maintained since the cards between the slides of the card-carriers can be moved and the possibility of adding new card-carriers whenever needed make the intercalation of future entries easy.³⁹

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In the Office's Repertory the cards are classed according to the *Decimal Classification*. To make searching easier, the bibliographical cards, which are white, are filed behind coloured divisionary cards which are higher than the others. These divisionary cards have the classification numbers on them. Their colour and their format vary with the degree of division they indicate. The bibliographical cards contain the name of the author, the title of the book, its size in number of pages, its format, the name of the publisher, the year of publication and the price of the volume, or the title of the periodical, the year, and the page. Each card also contains more or less complete bibliographic notes about the work being catalogued.

First, for all cards there is the classification number - that is to say, the classification number from the *Decimal Classification* - and an identification or order number. The Bibliographical Repertory is the Registry-General for works of the mind. It is important, therefore, that concurrently with the family name, here the classification number, each written work should receive its own individual name which is the identification number. In the Office's system this is a serial number which is never repeated twice. Each year a new series is begun which is distinguished from the others by the year itself which becomes a denominator. Thus, all the books and articles which appeared in 1895 belong to the same series, and numbers are given to books in the order in which they become known to the Office. This series has 1895 for its denominator, e.g. 12,525/1895 while the denominator of the series of books for 1848 is 1848, e.g. 12,525/1848 and so on.

It is possible, therefore, to identify each book while avoiding the inconvenience of numbers which are too large. On the other hand, these distinct sequences provide a basis for statistics for intellectual works - all the more readily because they are combined with classification numbers. It is possible to know for each year the total number of works published and the number of each kind of book. The identification number also facilitates the correction of errors. When any member of the vast bibliographical cooperative which the Office proposes to create, points out a classification error to the central administration or when the size of a category or the discovery of new or omitted subjects necessitates the creation of new sub-divisions, it will be easy to indicate to everyone concerned what corrections and changes should be made. The Office, for

example, by means of a periodical bulletin intended to maintain consistency of classification in all local Repertoires, will announce that card 12,525/1895 classified at 525.3, should be placed at 525.2, or that the basic division 525.3 should henceforth be sub-divided into 525.31 and 525.32. As a consequence of this, the cards classified at the old division will be classified as follows:

Under 525.31	12,525/1895	12,537/1848 etc.
Under 525.32	536/1836	2741/1858 etc.

Another kind of annotation is possible for the cards of the Repertory: the location of each work, as recommended by M. Van der Haegen, the scholarly librarian of the University of Gand [Ghent].⁴⁰ However, as important as such information is, it is impossible to have it on all the cards. A distinction must be made. When a work is truly rare, if it is held in only a few places, it is of international importance to know where these places are. But this is as useless as it is impossible for recent works. They have not yet had time to reach the great libraries or can be easily procured through the booktrade. Nevertheless, union catalogues can be easily organised on a national basis. In every capital city a general catalogue listing the contents of all the national depositories should be associated with the principal library. The Universal Bibliographic Repertory can serve as a basis for such catalogues.

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Having indicated how the decimal classification of subjects and the arrangement of bibliographic entries on separate cards provide more or less definitive solutions to the most important questions which the creation of a Universal Bibliographical Repertory raises, we must now describe the plan of work which we propose. The immense size of the task to be undertaken is such that we can only hope to realize it by means of order, method and the utilization of all existing work.

First, it is necessary to avoid all delay while the work is being finished. It is also necessary to organise the work without trying to be complete and error-free from the beginning. The need for a single bibliographic repertory is so great that its implementation should not be further delayed by any pretext that it must be perfect from the outset. Let us clear the ground first and rapidly accumulate two or three million of the most easily procured references. Let us resign ourselves to 25 or 30 per cent error either in the text of the notices or in the classification which will be given them. Errors and omissions will be corrected later, and very easily, because of the system of separate cards that we have described. These corrections will be a task for everyone, for, reproduced in a great many copies, the Repertory will be available for anyone to point them out.

The bibliography of older works should be prepared according to different procedures from those used for modern works. Let us examine separately the two kinds of work. For the past, a considerable number of special bibliographies exist. Léon Vallée has listed about eleven thousand of these in his *Bibliographie des bibliographies*.⁴¹ Many of these bibliographies duplicate each other. On the other hand, taken as a whole they are far from comprising a complete inventory of intellectual production up to the

present. The first task which must be undertaken, therefore, is the indexing of the existing bibliographic sources and the preparation of a complete table of them, a sort of integrated bibliographic map showing, beside the regions already explored, those which remain to be discovered.

This vast work of co-ordination can only be completed successfully by a special institution, a permanent organisation for bibliographic interests which enjoys the popularity and scientific respect needed for it to be able to obtain everywhere the information necessary for its work. This institution, which will be the International Office of Bibliography, with the agreement of the authors most generally concerned with these matters will therefore first publish a huge bibliography of bibliographies on cards classified according to the *Decimal Classification*.

This first part of the repertory, containing the most general sources of knowledge and being immediately made available to all, will also be the first to benefit from the co-operation of all. Immediately afterwards will come the publication of the contents of the works thus listed. Here again it is a question of re-using existing work, but in the form peculiar to a catalogue. Through the efforts of the Office and of its collaborators, all duplication will be eliminated, and standardisation will be obtained because of the existence of a standard classification. While this undertaking is proceeding, and several years will be necessary for it alone, independent bibliographers will of course continue their work as in the past, and will, therefore, fill in gaps. The efforts of the Office towards unification, however, will help to draw the attention of researchers especially to areas which have so far been too much neglected, and thus, gradually, the blanks in the great bibliographical map will disappear.

One can foresee, also, that bibliographers will slowly modify the form of their work and will seek to benefit from the advantages which the Office will be able to offer them. They will bring their manuscripts to it as to a great publisher. The Office will acquire their work and incorporate it in the Repertory, perhaps even under the signature of each author. Bibliographers will be certain of finding - a rare thing today - a fair remuneration for their work and a special public to appreciate it. As for the Office of Bibliography, it will find numerous and valuable collaborators in these independent bibliographers.

Inventorying current production necessitates initiating other procedures. Here, also, however, the role of the Office is nearly exclusively that of organiser and co-ordinator. Numerous periodical national bibliographies and periodical special bibliographies exist. They correspond to two distinct phases of work: national bibliographies for the most part limit themselves simply to the *registration* of published works. Listing and not classification is their principle task. Special bibliographies, on the other hand, give *classification* a major place and can undertake this work with all the more care in that they are less concerned with listing. Moreover, the best of them add indexing of periodicals to the indexing of books and this increases their usefulness considerably.

The appearance of the *Universal Repertory* will place no pressure on national bibliographies or special bibliographies to discontinue, but it is important that their role be better defined and that each takes its place in a better-organised whole. National bibliographies should be more complete in the future than they are now. Their publication is slow. Omissions are frequent and entries often very incorrect. It is at this

point that the International Union of Berne must intervene.⁴² By everywhere recommending legal deposit, by bringing together all information about authors' copyright, and by undertaking, either alone or with the help of the governments which are members of the Union, to draw up a complete listing of current publishing, it could make a considerable contribution to the formation of a universal subject repertory, to which it would thus contribute actual materials.

As for special bibliographies, an agreement would have to be reached between them and the Office. They would maintain all the independence that they have now, but, in return for certain advantages to be stipulated by contract, they would undertake henceforth to adopt the *Decimal Classification* of the Office of Bibliography. The latter would thus be surrounded by absolutely competent groups which have long been equipped to carry out successfully the work they will be asked to do.

Having eliminated all of the inevitable duplication, the Office would re-issue the contents of these special publications in the form of a catalogue. Special bibliographical publications today cover almost the whole field of intellectual production. The Office will undertake to create such bibliographies for those branches of knowledge which hitherto have so far not had them. Already, on its initiative, three bibliographical periodicals have begun to take the steps we have been advocating. These are the *Classified Indexes* of Law, Sociology,⁴³ and Philosophy.⁴⁴ Classified indexes of philology and literature are in preparation.⁴⁵

One can count on the fact, moreover, that publishers and authors themselves will become permanent collaborators in the repertory. They will find it a most efficacious advertising medium because copies of the repertory will be available in all intellectual centres and will be consulted daily by thousands of readers. Henceforth publisher's catalogues and announcements of new books will be re-issued with the help of the Office whose job it is to publish the repertory. There will be every benefit from this. Classification numbers, which will eventually be printed on the books themselves or at the top of articles in periodicals as part of their titles, will be expertly assigned. Useful notes, such as the principal chapters of a work, or even a succinct analysis of the subjects with which it deals, will be added to bare bibliographical entries. Each work dealing with several subjects will receive several cards.

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This very general account is sufficient to demonstrate that a *Universal Bibliographical Repertory is possible*.

The programme recommended by the Office of Bibliography will doubtless provoke criticisms and reservations, but it seems difficult to deny its basic importance. We present it not as a personal work but as the synthesis of what has been done and proposed by a great number of *bibliographers of every country*.

The measures by which this programme will be realized practically are the following:

1. The creation of an International Institute of Bibliography, whose object will be the study of all questions related to bibliography in general and more especially the

elaboration of the Universal Repertory. This Institute will have to decide on bibliographical standards and take all necessary measures for their adoption by all who are interested: scholars, librarians, publishers, and authors.

2. A great extension to the work commenced by the International Office of Bibliography. The Office will become the executive organ for the decisions of the Institute of Bibliography. This Office, whose organisation at the moment is only provisional, will be definitively constituted on the basis of a vast co-operative society whose members will be all those who are interested in the creation of a Universal Repertory: states, government departments, scientific associations, librarians, publishers, authors, and scholars. A Universal Repertory will be published by this Office on cards classified according to the *Decimal Classification*. All bibliographical material presently existing will be fused in the Repertory. Local Bibliographical Offices, open to all and in continuous receipt from the Central Office of bibliographical notices printed on cards, will be created in all cities and in all intellectual centres. These local Offices will be important components of all the great libraries where they will quickly be identified with the Libraries' cataloguing sections, today so costly to maintain and of such incomplete usefulness.

3. An International Bibliographical Union between governments. They will guarantee to undertake all necessary measures for the regular registration of books and will encourage the elaboration of the Repertory by subscribing to copies on a pro-rated basis according to their respective populations and the amount of their annual literary production.

Editor's Notes

1. H. La Fontaine et P. Otlet, "Création d'un Répertoire Bibliographique Universel: note préliminaire," *IIB Bulletin* 1 (1895-96): 15-38. This was issued separately for the International Conference of Bibliography in Brussels in 1895 and was published in 1896 as Publication No.1 of The Office International de Bibliography. The text is followed by specimen tables of the Decimal Classification: a first table (10 major classes), a second table (100 major sub-divisions), a third table with 336, Public Services, subdivided to as many as 4 places after the decimal point, and a fifth table, a specimen of the index to the tables.

The motto with which Otlet heads his paper, "Who knows where knowledge may be had is near to having it" appeared on each edition of Poole's *Index* (see note 17 to this paper). W.I. Fletcher reports that the tradition is that Poole had it from the then professor of Latin at Yale, James L. Kingsley, and that it has no classical origin (*Library Journal* 20 (1896):316). It was used frequently on IIB publications. It first appeared on the 1894[?] prospectus for the L'Office international de bibliographie sociologique.

2. Otlet refers here to the 6th International Geographical Congress to which was presented a report by Prof. Dr. Brückner on what had been done to carry out the decisions of the 5th Congress about compiling geographical bibliographies for all the states. Brückner indicated what was afoot in various states in the bibliography of

geography, and his resolution, that further study of the questions of geographical bibliography be undertaken, was adopted (*Report of the Sixth International Geographical Congress* ...London: John Murray, 1896, pp. 387-389). Brückner's report and some brief remarks on the bibliographical work of the Congress appeared in the *IIB Bulletin* 1(1895-96): 130-133.

3. Details of the discussions about the scheme of the Association française pour l'Avancement des Sciences are given by its secretary M. Gariel in a statement on the resolutions adopted by the Congress of the Association at its meeting in Bordeaux, August 1895. The statement appears in *IIB Bulletin* 1 (1895-96): 62-66. The problems examined by the Society were those of formulating precise titles for scientific papers and how to choose title words for subject indexes.
4. The report of the Dresden meeting of the International Literary and Artistic Congress for the Protection of Intellectual Property (which was closely associated with the Bureau of the Berne Copyright Union) indicated that the subject of a universal catalogue had been discussed at previous conferences but that never before had an actual proposal for the creation of such a catalogue been submitted. Jules Lermina, 1839-1919, a journalist, prolific author of popular novels, and also the permanent secretary of the Association, promoted the scheme. The Dresden Meeting agreed that the proposed catalogue was in the international interest but, because of some suspicion of and opposition to the project, deferred studying ways of carrying it out until a later meeting (*Droit d'auteur* 4 (1895): 138). It should be noted that Otlet and La Fontaine were present at this meeting, which followed by about three weeks the first International Conference of Bibliography at which the IIB had been founded. They spoke out against "pessimistic views" which had been expressed as to the feasibility of a universal catalogue and described how they proposed to go about it in Brussels.
5. The setting up in 1894 of a committee of the Royal Society to study the creation of a "scientific subject-catalogue which it is proposed to carry out by means of international co-operation" and the distribution throughout the learned world of a circular letter of enquiry about support for such a venture are described in the "President's Address" *Proceedings of the Royal Society of London* 57 (1895): 44. The *IIB Bulletin* reprinted these and most other documents issued by the Royal Society on the *International Catalogue of Scientific Literature* in the first decade of the century.
6. The subject of a great catalogue had been raised in 1893 before the Class of Letters of the Académie Royale des Sciences, des Lettres, et des Beaux-Arts de Belgique by Ferdinand Van der Haeghen, the Librarian of the University of Gand. His communication, "On a General catalogue of Public Libraries" discussed how an international union catalogue could be compiled and printed by an International Bureau of Bibliography (*Bulletins de l'Académie royale des sciences et des lettres et des beaux-arts de Belgique*, 3rd Series, 26 (1893): 690-94). The scheme essentially derived from Van der Haeghen's own monumental *Bibliotheca belgica* which had been under preparation for fifteen years and was being issued in the form of separate slips for each book described.

The Academy set up a committee to consider Van der Haegen's proposals and a favourable report was received (*Bulletins de l'Académie royale des sciences des lettres et des beaux-arts de Belgique*, 3rd Series, 27 (1894): 397-402). The report included a draft constitution of a *Bureau Bibliographique International*. Before the Academy approached the Belgian government to put the scheme into effect, the report suggested that the opinions and agreement of the other sections of the Academy should be obtained. Michel Mourlon, director of the Class of Sciences in the Academy, later director of the Belgian Geological Commission, described what the commission had undertaken for geological bibliography in Belgium. He indicated that the Academy had just received the proposals for an International Catalogue of Scientific Literature from the Royal Society in London. He proposed that the Class of Sciences set up a committee to consider whether a common scheme could be worked out with the other Classes of the Academy to support Van der Haegen's proposal or whether scientific literature should be dealt with separately. In this case, the question then arose as to what kind of response should be made to the Royal Society's letter if the Belgium government's support of the scheme could be assured (Michel Mourlon, "Sur le création d'un Bureau International de Bibliographie" *Bulletins de l'Académie royale des sciences, des lettres et des beaux-arts de Belgique*, 3rd Series, 27 (1894):474-4)

7. Antoine Teissier, 1632-1715, a Protestant forced from France by the revocation of the Edict of Nantes, took up residence in the Court of Frederick I of Prussia. A renowned scholar, among his many works, most of them translations from Latin and Greek, was *Catalogus auctorum qui librorum catalogos, indices, bibliothecas, virorum litteratorum vitas elogia, aut orationes funebres scriptis consignarunt . . .* Geneva, 1686 and 1705. This was a revised and enlarged version of the *Bibliotheca bibliothecarum* of Phillippe Labbé (1607-1667). It was followed by a supplement in 1705.
8. Francesco Marucelli, 1623-1703, collected works of art and a great library. His *Mare magnum omnium materiarum sive index universalis alphabeticus* was a manuscript index in 112 folio volumes of all that he had read during the course of his life. It is preserved in the Biblioteca Marucelliana in Florence, a "public" library (opened in 1752) that was set up to receive a bequest of books and pictures from him.
9. Fabianus Justinianus, 1578-1627, was later in life Bishop of Ajaccio. Before his elevation he had care of the Biblioteca Vallicelliana for the order of Saint Phillip Neri of which he was a member. His *Index universalis alphabeticus, materias in omni facultate consulte pertractans, eorumque scriptores et locos designans*, appeared in Rome in 1612.
10. Georg Draud, 1573-1630 (or 1635), Lutheran pastor of Ortenberg, was responsible for a number of "laborious compilations" of various kinds (Michaud). He is chiefly remembered for his bibliographical works based on catalogues of the Frankfurt book fairs: *Bibliotheca classica . . .* 1611, *Bibliotheca exotica . . .* 1610 and *Bibliotheca librorum germanicorum classica . . .* 1611. The three works were extensively revised

- and reprinted in 1625. They were praised highly by Schneider as among the most important accomplishments of German bibliography before the Thirty Years' War.
11. Raffaelo Savonarola, 1646-1730, was a member of the order of the Theatines, a Roman Catholic religious order devoted to "the renovation of the priestly and apostolic life by means of prayer, the practice of poverty, and study" (*Encyclopedia of Religion and Ethics*, "Religious Orders (Christian)". In 1698 and 1714 Savonarola issued the prospectus for his *Orbis litterarius universalis* which was to be a bibliography on the model provided by Draud and Lipenius of works issued in all languages up to 1700. The work represented twenty years of labour and the manuscript comprised forty folio volumes. *Universus terrarum orbis scriptorum calamo delineatus . . .* which appeared in 1713 is thought to be the only portion of the grander work to be published. It was issued under the pseudonym, Alphonsus Lasor a Varea. The manuscript of the *Orbis Literarius Universalis*, still extant towards the end of the eighteenth century in the Library of the Theatines in Padua, appears to have been lost at some time in the nineteenth century.
 12. Martin Lipenius, 1630-1692, was a German scholar who occupied various academic posts during a lifetime that was shortened, it has been said (Michaud), by exhaustion from the excesses of his labours, though a span of sixty-two years does not, for the period, seem unduly abbreviated. The bibliographies published in Frankfurt by Johannes Fridericus were called "Real" because they were arranged alphabetically by subject word, not alphabetically by author.
 13. Johann Heinrich Christoph Beutler, 1759-1833, held a number of teaching and ecclesiastical posts. His "Universal Subject Index of the Important German Periodicals and Magazines" was followed in 1793 by *Moral Philosophy and Worldly Wisdom* which was in its seventh edition by 1816.
 14. Samuel Ayscough, 1745-1804, eventually obtained employment at the British Museum as an assistant librarian, and was later ordained. He has been called a "Prince of Index-Makers" (*Dictionary of National Biography*). As well as the index to the *Monthly Review* mentioned by Otlet, he was responsible for an index to the *Gentleman's Magazine* for the years 1731-86 (this was issued in 1789) and, among many other indexes, for a concordance to Shakespeare's plays in 1790. Volume I of the *General Index to the Monthly Review . . . completing the first series of that work in two parts*, had a first part "Containing a Catalogue, With the Size and Price, of all the Publications reviewed"; the second had the title as given by Otlet. (for an account of Ayscough see W. Boyd Rayward, "The Perils of Bibliography...").
 15. A history of the *Bibliographie de la France*, begun in 1811, is provided in its special September 1961 issue, "Numéro du cent-cinquantenaire," of "l'édition française" (Cl. de Buzareingues, "Historique de la Bibliographie de la France," pp. ix-xxxvi).
 16. *Bibliotheca philologica; oder, Geordnete uebersicht aller auf dem gebiet der classischen Alterthumswissenschaft wie alteren und neuern sprachwissenschaft neu erschienenen bücher . . .* 1-50 jahrg., 1848-97. This, with variation in sub-title, was a semi-annual from 1848-85, and then a quarterly; *Bibliotheca orientalis or, a Complete List of Books, Papers, Serials and Essays Published in 1876 in England*

the Colonies, Germany and France on the History, Languages, Religions, Antiquities, Literature and Geography of the East. Comp. by Charles Friederici. London: Trübner and Co., 1877-1884; *Zeitschrift für die gesamte medicin mit besonderer Rücksicht auf Hospitalpraxis und ausländischen Literatur.* Edited by J.F. Dieffenbach, J.C.G. Fricke and F.W. Oppenheim. This appeared in Hamburg in 45 volumes between 1836 and 1851.

17. Poole's *An Alphabetical Index to Subjects Treated in the Reviews and Other Periodicals* which appeared as a slim volume of 154 pages in 1848, comprised 1442 pages by the third edition of 1882. It was compiled "with the assistance as associate editor of William I. Fletcher . . . and the cooperation of the American Library Association and the Library Association of the United Kingdom." In fact, Poole's attempt to enlist English help on his *Index* was not particularly successful. Various revised editions of Poole and a series of supplements were issued between 1888 and 1908. Publication of the *Cooperative Index to Periodicals*, edited by Fletcher, was begun in 1884 and it eventually covered the period 1883 through 1891. Intended as an attempt to keep Poole's *Index* current, it was first issued as monthly supplements to the *Library Journal*. Later it became quarterly and in 1890 and 1891 appeared only as an annual. The necessity for it was obviated by the appearance in 1901 of H.W. Wilson's *Reader's Guide to Periodical Literature* which is still issued.
18. This Section of the American Library Association was to be "an organisation for cooperative catalog and index work" and among the tasks proposed for it were collaboration with publishers in the printing of catalogue cards for new works and the preparation of the *ALA Index to General Literature*. An account of the ALA Publishing Section and a brief description of the *ALA Index* appeared in *IIB Bulletin* 1 (1895-96): 135-136.
19. An unsigned editorial, doubtless by the editor, Melvil Dewey, in what was initially called the *American Library Journal*, September 30, 1876, sums up (p.13) the objectives of the journal: "In a word the *American Library Journal* hopes to collate for the librarian every view or fact which may be of use or interest in his work, to the saving of time, money, and effort for him, and, as a final aim, to the advancement of his honorable profession."
20. The story of Melvil Dewey's School of Library Economy, first opened in 1884 at Columbia University has been told many times; see for example, Sarah Vann, *Training for Librarianship Before 1923*, Carl White, *A Historical Introduction to Library Education*, and for an interpretative account of the failure to keep the school at Columbia, W. Boyd Rayward, "Melvil Dewey and Education for Librarianship". The School opened at Albany in 1889 in the New York State Library under the auspices of the State University. The account of the school in *IIB Bulletin* 1 (1895-96): 138-139 does not indicate that the MLS and DLS degrees as well as the BLS (described as *bachelier-ès-sciences bibliologique*) could be awarded.
21. The Library Bureau of Boston was begun by Melvil Dewey responding in part to the efforts of and the needs represented by the American Library Association's Supplies Committee. Under the management of H.E. Davidson, as Fremont Rider says "it

became a pioneer in revolutionizing, not merely library equipment -- which, as a matter of fact, in a few years became only a side line in their sales -- but office equipment and business methods generally (Fremont Rider, *Melvil Dewey*, p. 65). Eventually it became part of the Remington Rand Company. The Library Bureau was important to Otlet and La Fontaine. They did business with its London branch, managed by Cedric Chivers, and had several meetings with Davidson in an attempt to induce him to set up a European branch in Brussels.

22. John Shaw Billings, 1839-1939, supervised the publication of the *Index-Catalogue of the Library of the Surgeon-General's Office, United States Army*, in 16 volumes from 1880 to 1895. This was called an index-catalogue because it indexed articles in journals. It was arranged, however, as a dictionary catalogue. Billings became the first director of the New York Public Library in 1896. An unsigned review of the *Index-Catalogue* was published in the *IIB Bulletin* 1 (1895-96): 255-56. Frederick Leyboldt began to publish *Index Medicus*, a Monthly Classified Record of the Current Medical Literature of the World, in 1879. It was edited by Billings and Robert Fletcher. Always precarious financially, it continued to be published after Leyboldt's death in 1884 in the United States until 1899. French associates of Otlet and La Fontaine, Charles Richet and Marcel Baudouin, were then to assume responsibility for attempting to keep it going in Paris until 1902. (Bibliographers tend not to list the French publication in their accounts of the various series of *Index Medicus*). The work has been published under various auspices in the United States from 1903 until the present.
23. Otlet is referring here to: *Catalogue of Publications of the Smithsonian Institution (1846-1882) with an alphabetical index of Articles in the Smithsonian Contributions to Knowledge, Miscellaneous Collections, Annual Reports, Bulletins and Proceedings of the U.S. National Museum and Reports of the Bureau of Ethnology*, by William J. Rhee. Washington: Smithsonian Institution, 1882. Rhee, 1830-1907, had been made Chief Clerk of the Smithsonian in 1852 and, as executive officer under the Secretary, had oversight of the affairs of the Institution and responsibility for its publications. He was regarded at the time of his death as "the principal human repository" of the history of the Institution, for his knowledge extended back to the actual founding period (*Dictionary of American Biography*).
24. Julius Petzholdt, *Bibliotheca bibliographica . . .* W. Englemann: Leipzig: 1866. The work of Petzholdt, a librarian, has sometimes been regarded as a model for the compilation of a comprehensive bibliography of bibliographies. Taylor provides a full and critical account of this work. As for size, Taylor accepts Besterman's estimate that the work contains references to 5,500 titles.

Léon Vallée's *Bibliographie des bibliographies*, (Paris, 1883) had a supplement issued in 1887. Vallée's work has been somewhat indiscriminately condemned. Taylor evaluates and supports criticisms of it and refers to reviews and other accounts. A large work, the number of titles included, however, is nearer 10,000 than the 11,000 Otlet mentions and, if Langlois is correct, a third of these should have been omitted and another third added (Langlois, *Manuel de bibliographie historique*).

25. Johannes Müller, *Die Wissenschaftlichen vereine und gesellschaften Deutschlands im neunzehnten jahrhundert.* Berlin, 1883-87. Muller, 1850-1919, was at one time Director of the Reichstagbibliothek in Berlin. Langlois describes this work as classic, but points out that, though it gives general bibliographic information, it is not an index to the contents of these publications (Langlois, *Manuel de bibliographie historique*).
26. Jacques Charles Brunet, 1780-1867, *Manuel du Librairie et de l'amateur de livres*, 1810. The first edition of three volumes grew to six in the fifth and final edition which appeared between 1860-65. The sixth volume, after a history of classification systems, disposes the author entries of the first five volumes according to a system of classification that was to be widely imitated in its time. Brunet, born into the bookselling trade, devoted himself exclusively to bibliography after the death of his father in 1824. It has been said of his work that, "with *eclat* it brought to a close the era of great general bibliographies and continues to be irreplaceable" (Malclès, *Manuel*).
27. Otto Lorenz, *Catalogue général de la librairie française*, 1867-88. This listed all French imprints from 1840 to 1865. Lorenz issued supplements covering the period to 1885. It was then continued by other hands. By 1945 when it ceased publication, the work was in 34 volumes and covered the period 1840 to 1925. Lorenz, 1831-1893, was born in Leipzig but set up in the book trade in Paris in 1853 and was naturalized as a Frenchman in 1866.
28. Wilhelm Heinsius, 1768-1817, published his *Allgemeines Bücher-Lexicon* in 1793. Subsequent editions by Heinsius himself and, after his death, by others, provided a retrospective bibliography in nineteen volumes of German publishing from 1700 to 1894.
29. Otlet refers to the two series of the *Catalogue of Scientific Papers* published by the Royal Society of London that had appeared up to this time. See Editor's note 19 to Paper 1, "Something About Bibliography," in this volume.
30. Jean-Charles Houzeau de Lehaie and Albert-Benoit-Marie Lancaster, *Bibliographie générale de l'astronomie*. The work is bibliographically confusing. Intended to be in three volumes, only volumes I (and only two of three parts intended for this volume) and II were issued. The work appeared in parts in paper covers between 1880 and 1889 together with some supplementary material. Volume II was the first to be published and the second part of this was published first. Because volume II appeared first, the compilers' introduction appeared at the beginning of it. Both practicing scientists, Houzeau and Lancaster were colleagues in the Royal Observatory of Belgium, where the former was Director and the latter librarian and Secretary. Dewhirst believes that after Houzeau's death in 1888, Lancaster lost spirit to complete the work. It was intended to provide a complete record of "all that had been written about the science of the heavens since the beginning of history, including not only printed works, but all the earlier manuscripts that were known" (Dewhirst, "Editorial Introduction," *General Bibliography of Astronomy to the Year 1880*).

31. Printing of the general alphabetical catalogue of the Bibliothèque nationale did not begin until 1897. The first volume of a series of subject catalogues, however, Section L., Catalogue of the History of France, appeared in 1855 and there were a good many of these subject catalogues begun before it was decided in 1874 to abandon this procedure, complete those in process and then begin publication of the general catalogue. It is to these "catalogues méthodiques" that Otlet refers.
32. Printing of the *General Catalogue of the British Museum* began in 1881. It was completed in 1900 in 94 volumes. A supplement of 13 volumes was issued in 1905. A lively account of this complex venture is given in Barbara McCrimmon, *Power, Politics, and Print: The Publication of the British Museum Catalogue 1882-1900*.
33. The Institut Colonial International was founded in January 1894 to facilitate and develop the comparative study of administration and law in colonial territories.

One assumes Otlet refers to the Service Géologique of the Ministère de l'Industrie and du Travail though it was not formally set up by Royal Decree until December 1896. Its mission was to preserve all existing data and to assimilate to them the results of all new observations carried out on Belgian territories. It acquired national and international literature on all aspects of the geologic strata, terrain and sub-soils of these territories. The Director was Michel Mourlon(see also Note 6 above), who was much interested in problems connected with geological literature and classification, and the Secretary, G. Simoëns, who made a number of studies of the Decimal classification.

34. For the *International Bibliography of Mathematics* see Otlet's discussions in and Editor's Note No. 18 to the first paper, "Something about Bibliography," in this volume.
35. U.S. Bureau of Education, *Catalog of the ALA Library: 5,000 volumes for a Popular Library Selected by the American Library Association and Shown at the World's Columbian Exposition*. Washington: Government Printing Office, 1893. The Catalog, sometimes called the *ALA Catalog* or *ALA Model Library Catalog*, is in three parts: Part I is a classified catalogue according to the Decimal Classification; Part II is a classified catalogue according to Charles Ami Cutter's Expansive Classification; Part III is a dictionary catalogue. The Introduction to the Catalog is explicit: "The question whether a classed or dictionary catalogue is more useful is still unsettled though much has been written on the subject" (p. viii). Otlet is thus a little too carefully selective in the detail he gives of the work! The account of the Catalog in *IIB Bulletin* 1 (1895-96): 137, though expatiating on its utility, equally ignores Parts II and III.
36. A good description of various attempts, begun almost from the inception of ALA, to obtain centralised cataloguing is provided by Edith Scott's "The Evolution of Bibliographical Systems in the United States, 1876-1945." Otlet refers to efforts begun in the Publishing Section in 1887 and represented by an announcement by the Library Bureau: "Printed Catalog Cards for Current Books: A Guaranteed Fact Not a Mere Experiment," *Library Journal* 18 (1893): 528-30. The experiment, for it was in fact no more than that, was not successful, had few subscribers, only limited support

from publishers and was transferred in 1896 to the ALA's Publishing Section, the whole business being surrendered "with great satisfaction" by the Publishing Section to the Library of Congress when the Library began issuing its cards in 1901 (*Library Journal* 26 (1901): 757).

37. Alphonse Bertillon, 1853-1914, developed a system of identification of criminals which was used by the Parisian police and later in other countries. It consisted of making a numerical and verbal "portrait" so precise and systematic that it would provide proof of identity. This procedure, according to Bertillon, "consists less in the search for new characteristic elements of individuality than in the discovery of a method of classification." Bertillon believed he had discovered such a method involving anthropometric identification which required, 1) careful measurements of specific parts of the body; 2) descriptive identification in words using a controlled vocabulary of hair and eye colour, for example; and 3) identification by peculiar marks. The identification was then recorded on a special card ("Introduction," to Bertillon's *Signaletic Instructions*). The system was introduced in 1882 and was constantly refined.
38. Two publications seem relevant to Otlet's description of the tables being prepared at this time. First is a document of 14 unpagued leaves: *Decimal Classification. Tables générales, General summaries, Haupttheilungen*. Bruxelles: Office International de Bibliography, 1895. This contained the first thousand divisions in French. A fuller version for Sociology and Law was: *Decimal Classification: Sociology, Sozialwissenschaft, Sociologie. Tables méthodique et alphabétique; Methodischer und Alphabetischer Index; Methodical and Alphabetical Index*. Bruxelles: Office International de Bibliographique, 1895. This consisted of 78 unnumbered pages of the tables for Sociology and Law with notes and with, even at this stage, an indication of synthetic developments; for example, under 327 International Politics are scope notes, "see also" references and examples such as 327 (45:494) Italian-Swiss Conflict. The table for Law, 340 includes numerical developments for "Generalities" and auxiliary sciences: for example, 340.005 periodicals and reviews; 340.09, Law and history; 340.09.2 "legal Biographies, classed alphabetically." The index is a simple tri-lingual list. A number of translations of other major sections of the classification were issued in 1896.
39. Rudolph describes a part of this apparatus (the binder, not the drum) in his "The Newberry Genealogical Index" in *The Library Journal*, (1899): 53-55. A recent evaluation of Rudolph's binder and the Rudolph Continuous Indexer is given in Rick J. Ashton's "Curators, Hobbyists, and Historians: Ninety years of Genealogy at the Newberry Library." Rudolph was a fascinating character. He fought in the Russo-Austrian War in 1866. He came to New York in 1875 and eventually joined the Newberry Library in Chicago in 1894 where he invented the Rudolph Indexer and Binder. He left the Newberry in 1909 to speculate on the stock market. In 1915 at the age of 65 he married his second wife and in 1917 committed suicide because he had lost most of his money and was going blind and deaf (information from newspaper clippings and the Newberry Librarians' Reports courtesy of Diana Haskell, Newberry Library).

40. See Editor's Note 6 in this paper.
41. See Editor's Note 24 in this paper
42. The Berne International Copyright Union was set up in 1886. An office or bureau created for it by the Swiss government began operations in 1887. The text of the convention governing the Union has been revised a number of times and the 100 years of the Union's operation the number of nations joining it has steadily grown. The United States did not become a member until 1988. The purpose of the union was, and, is to protect the literary and artistic rights of authors. At the time Otlet was writing the following states were members: Belgium, France, Germany, Haiti, Italy, Siberia, Spain, Switzerland, Tunis and Great Britain.
43. Otlet and La Fontaine refer to: *Sommaire méthodique des traités, monographies et revues de droit*. This began with a similar name in 1891, and volumes 1-3, 1891-1893, were prepared by Otlet, Pierre Blanchemanche and Joseph Cassiers. In 1895 volume 4 (for 1894) was taken over by Otlet and La Fontaine and was published by the Office International de Bibliographie. It was part of what was described as the *Bibliographie internationale des sciences sociales*. The second part of this, also published by Otlet and La Fontaine, was *Sommaire méthodique des traités, monographies et revues de sociologie*. For the 1895 volume both works were combined to become *Bibliographia sociologica: Sociologie et droit. Sozialwissenschaft und Recht. Sociology and Law. Sommaire méthodique des traités et des revues dressé conformément à la Classification Décimale*. Only the one volume seems to have been issued.
44. Maurice de Wulf, editor of the *Revue néo-scolastique* (published by the Société Philosophique headquartered in Louvain at the Institut Supérieur de Philosophie), undertook to add a bibliographical supplement to the Revue. The first issue appeared as *Sommaire idéologique des ouvrages et des revues de philosophie*, 20 July 1895. It had an account of the Decimal Classification and a discussion of certain problems in the Classification. This introduction was repeated verbatim in the first issue for 1896 (supplement to the February 1st 1896 *Revue*) with further commentary added. Following this were the tables of the Decimal Classification for philosophy as developed in Louvain at that time. This bibliographic work continued until the First World War and, indeed, has continued in some form ever since. In a brief note on the OIB and the 1895 Conference of Bibliography, de Wulf describes the *Sommaire idéologique* as "an experimental application of the Dewey system, the first application to our knowledge which has been presented to the Belgian public, and perhaps to the European public." (*Revue néo-scolastique* 2(1895): 429). The bibliographic supplement was referred to as *Bibliographia philosophica*.
45. The periodicals for philological and literary bibliography that Otlet refers to do not seem to have been published. In these bibliographies and the rationale provided for them lies the beginning of the *Bibliographia Universalis*.

3. ON THE STRUCTURE OF CLASSIFICATION NUMBERS¹

When the Brussels Conference adopted Mr. Dewey's classification as a whole, it did not intend to proclaim that the classification was to be considered perfect in every respect. The Conference did agree that it was sufficiently developed to be used as the preliminary basis for the Universal Bibliographic Repertory and was convinced that its principles were such as to assure its future development. The articles published in this issue of the *Bulletin* by Mssrs. Carus,² Baudouin,³ Daruty de Grandpré,⁴ and Simoëns⁵ as well as the documents issued by the Royal Society of London⁶ clearly suggest the different kinds of research being undertaken in order to improve the Decimal Classification and to make it responsive to all the requirements of bibliographic registration and analysis.

Considering this general question of its development in our turn, we would like to add some observations to those already published here [1] or set out previously in a note published by the International Office of Bibliography [2]. These observations synthesize propositions that have been advanced from various viewpoints on the structure of classification numbers but upon which no final pronouncement has yet been made.

• • •

The basic principle of a bibliographic classification in the first analysis should be sought in the best way of subordinating the various general characteristics exhibited by the works being classified. It is a vast synoptic outline, divided into classes, divisions and sections, of all the subjects on which it is possible to write. The major difficulty, apart from completely enumerating the subjects to be classified, is this: classification can be made from different points of view and the subordination of the characteristics of each subject is susceptible of equally satisfactory but quite different solutions. Let us take the example:

(a) Civil Law, Marriage, English Legislation, which we index: 347.62(42). Why should that order be preferred to this:

(b) England, Civil law, Marriage.

It could be just as useful to have everything concerning Marriage gathered together without distinction of country (a), as to find gathered together everything concerning English Law, without distinguishing between different institutions (b).

This first observation is best expressed by saying that the standard model of any classification, whether it is constructed by means of words or these words translated into decimal indices, is an array of ideas, each defining and specifying the other. The sense of A is defined by B, thus A:B. Moreover, as a general rule, each idea so subordinated can, in its turn, become a principal idea to which is subordinated other ideas on which it

[1] See *Bulletin*, p. 29 and 86.

[2] Règles pour les développements à apporter à la classification décimale publiées par l'Office International de Bibliographie, Bruxelles, 1896. 7

depends. Thus, in the example given, English Legislation, which is subordinated to the division Marriage in the first instance, becomes the principal heading in the second instance.

To this first observation, which touches upon classification only, another concerning bibliographical notation can be added. Classification numbers are formed by a kind of derivation by which a more general idea is made more specific by the juxtaposition of simple numerals. In fact, this is the most elementary form of the structure of classification numbers. To strip bibliographical notation of any meaning so that it becomes numerals put together into occasionally quite large numbers which can be distinguished only by external differences with little mnemonic value, is to deprive the notation of an element of diversity which could help make the terms intelligible to the ordinary reader. Now, one quickly observes that there are certain basic ideas which are present in all parts of the classification, such as geographical, historical and form categories which we have already discussed. In any individual branch of the classification there are also divisions which recur regularly; thus, in Zoology, for example, each species can be envisaged from the point of view of its anatomy, its evolution, its teratology,⁸ its form, its economic usefulness.

The consequence of this observation is that a structure of classification numbers is desirable such that to each category of basic ideas which regularly recurs, there should correspond a form of notation with a distinct appearance and a permanent meaning. Classification numbers will then be complex numerical expressions made up of different factors whose respective meanings when juxtaposed will express a complex idea after the fashion of compound words in spoken languages. If the geographic category, England, is always expressed by the symbol (42), and if this symbol can be directly combined with all or part of any classification number, the problem that we have just described is completely resolved, at least so far as a special case is concerned. We are effectively able to write:

- 347.62(42) Legislation concerning Marriage in England
- 709(42) History of art in England
- 595.77(42) The Diptera of England

There is no doubt that generalizing such a method of notation would be useful. First of all, it is eminently mnemonic. Next it increases the intelligibility of the classification numbers since a simple examination of the component factors of their external structure at once reveals the various individual ideas that make up the whole idea. These factors, once they are clearly distinguished from each other, can form a variety of combinations. Thus, it is possible to represent more than a million ideas by the combinations derived from a seven-digit number. Several millions of ideas can be represented when second-degree combinations, that is to say, those involving factors or parts of numbers, are added to these first-degree combinations.

Indeed, the parenthesis (42) = England, is susceptible theoretically of being combined with any classification number and thus of creating thousands of new subdivisions. Finally, the last advantage of proceeding in this way is that preserving the individuality of each structural component makes possible a different notation for the same idea to be classified according to whichever element one wishes to make primary, others being subordinated to it. Thus, while the meaning of the following three classification numbers is preserved because the factors are reversible, it is possible to write:

(42)347.62 347.62(42) 347(42)62

In addition, notation by means of factors permits the independent development of each in the future. For example, if we were to write:

591.1 Physiological Zoology
591.14 Physiological Zoology of molluscs

when, later, it is thought opportune to divide Physiological Zoology not by species but by the major subjects of Physiology, such as Circulation, Respiration, or the Nervous System, this can no longer be done. It would be quite otherwise if we had first written:

591.1 : 954	Physiological Zoology: Molluscs which can be developed later thus:
591.11 : 5945[<i>sic</i> for 9545?]	Physiological Zoology, respiration: Molluscs, Cephalopods [3].

• • •

The question of opportunity resolved, what remains to be examined is whether the following theoretical formulation for the internal structure of classification numbers can possibly be realized in practice: "Classification numbers are formed sometimes *by derivation* - by making a more general idea more specific by the juxtaposition of numerals, sometimes *by combination* - by adding factors or autonomous numerical elements which have a distinct and permanent meaning and which are able to assume different functions in relation to each other." This latter method helps to make the decimal classification a veritable bibliographical pasigraphy⁹ able to translate into a number any idea to be classified and to cope with all the details of bibliographical analysis [4].

Let us observe, first, that these elements or factors cannot be numerals pure and simple. While it is convenient to attribute the idea, "England," to 42, it is impossible without confusion to combine these two digits with any number: 597.42, for example, would indicate simultaneously Alcanthodidei and English fish. Thus, when one is forming numbers by simple derivation, it is always useful and desirable to use the same numbers or parts of numbers to express the same ideas. To establish a symmetrical correspondence between the subdivisions of the different parts of the classification, one should take the subdivisions of one subject area and use them as divisions of another. Thus, it is mnemonic to write 611.8 Anatomy of the Nervous System, 612.8 Physiology of the Nervous System, 613.8 Health of the Nervous System, for the technique of mnemonics uses symmetry as much as logic.

[3] Let us observe in passing that the intelligibility of a classification number does not depend on its conciseness, but on its apparent structure which permits the eye to read synthetically groups of figures corresponding to distinct ideas. The algebraic formula for the hyperbola is $b^2 - a^2b^2 = a^2b^2$. The same idea is expressed decimaly by the number 513.24. The classification of Hartwig's *Schema des Real Kataloges der Königlichen Universitätsbibliothek zu Halle a.s.* (p. 76) gives notations such as this KhII1FcBI4eII2. The Mathematical Bibliographic Index gives the number M³ShB.

[4] See the preceding studies of Daruty de Grandpré and Simoëns.

But a condition *sine qua non* of the autonomy of the numerical elements is that they should always be characterized by a distinctive sign. This has been done for the first auxiliary indices that have been proposed; the 0 for indices of form, the parenthesis () for geographical indices, and the : for the principal modifier [5].

One cannot, however, increase in an unlimited way the number of conventional signs. While it would be possible to conceive of them, they would make the classification unintelligible. Irremediable errors in writing and typography could be expected. But the greatest drawback is that, while the order in which the numerals 0 to 9 must be set down successively is universally known, it is necessary to establish an arbitrary order, which it is difficult to remember, for arranging signs.

The theoretical and practical aspects of the problem being thus clearly stated, let us indicate briefly some proposed solutions. First of all, use of specification by whole numbers has been considered. Any idea in the classification can be specified by another idea and the classification numbers corresponding to these ideas are separated by the sign [:] (*sic*). This leads us back to the fundamental formula A:B, or to take the concrete example cited above, 591.1 : 594 = Physiological Zoology: molluscs. This notation is the most explicit of all; each factor keeps its individuality and, there being no abbreviation, no explanatory conventions are needed [6].

Useful as a general means of establishing relations between all part of the classification, especially to indicate the relation of one subject with another (3:17 = relation between sociology and ethics; 7:17 = relation between art and ethics), whole number specification seems to be less useful for expressing divisions whose periodical recurrence is frequent. For universal divisions such as time, place and form, we have proposed the geographical, historical and form indices, which we have discussed.

But other categories are also very general such as, for example, chronology and language. To indicate them concisely, uniformly and independently, Mr. Dewey has proposed to combine letters with numbers. The letters, really substitutes for arbitrary conventional signs, would be used to indicate the transition from one order of ideas to another; they would imply a well-known order. This is the scheme. Letters not used are reserved for future use. The letters proposed are those which would create the least confusion in writing:

0. *Form Index* (with all its subdivisions), 01, 02.
- a.
- b.
- c. *Time, Geological Periods.* Divided like 551.7 stratigraphic geology, e.g. C1 Archean, C2 Cambrian, etc.
- d. *Time, chronologic history.* Divided thus:

1. B.C.	5. 1500-1599
2. 1-499 A.D.	50 1500-1509
20 1-49	51 1510-1519
21 50-99	52 1520-1529

[5] For what we have said on these three auxiliary indices and their use, see *Bulletin*, p. 90 and following.¹⁰

[6] See *Bulletin*, p. 91.¹¹

22	100-149	53	1530-1539
23	150-199	54	1540-1549
24	200-249	55	1550-1559
25	250-299	56	1560-1569
26	300-349	57	1570-1579
27	350-399	58	1580-1589
28	400-449	59	1590-1599
29	450-499	6.	1600-1699
3.	500-999 A.D.		60-69 like 50-59
	30-39 like 20-29	7.	1700-1799
4.	1000-1499		70-79 like 50-59
	40-49 like 20-29	8.	1800-1899
			80-89 like 50-59

e.g. International politics in 1895 = 327 d 895.

- f. *Physical Place.* Divided like 551.4 physical geology.

f 1	Continents	f 16
f 12	Islands	f 17 Fresh Water
f 13	Mountains	f 18 Rivers and Lakes
f 14	Caves	f 19 Springs, Wells, etc.
f 15	Plains, Prairies, Steppes, Deserts	

e.g. fresh water molluscs, 594. f 17.

- g. *Oceans.* Divided like 551.47, Oceans in geology. For example,

g 1	Atlantic, North Sea, Baltic
g 2	Mediterranean, Black Sea.

- h. *General Place.* Divided according to the points of the compass.

1.	Centre	6.	South
2.	North	7.	South-West
3.	North-East	8.	West
4.	East	9.	North-West
5.	South-East		

e.g. Travel in the south of Europe 914 h 6.

- j. Specialised place: political divisions. Divisions borrowed from 91 Geography and completed by the following table:

e.g. Civil Architecture in France. 725.1 j44 instead of 725.1(44).

j 11	Arctic and Antarctic Regions	j 21	Europe & Asia
j 12	Temperate Regions	j 22	Europe & Africa
j 13	Tropical Regions	j 23	Europe & America
j 14	Northern Hemisphere	j 24	Asia & Africa
j 15	Southern Hemisphere	j 25	Asia & America
j 16	Eastern Hemisphere	j 26	Africa & America
j 17	Western Hemisphere		

- k.

- 1.
- m.
- n. *Principal modifier.* The addition to a classification number of another whole classification number.
- p. *Return to the subdivision of the principal number.*

Examples:

598.2	Birds
598.205	Birds: ornithological periodicals
598.2 c 7	Birds in the Cretaceous period
598.2 d 1	Birds Before Christ
598.2 j 44	French Birds
598.2 j 13	Birds in the Tropics
598.2 n 579.1	Birds, skeletal organisation
598.2 n 73	Birds in Sculpture
598.2 n 821	Birds in English Poetry
598.2 j 43d44	Birds in Germany in the 18th Century
442. j 73 p2	U. S. Constitutional Conventions

This notation would become a little clearer perhaps if the numbers with letters were themselves placed in parentheses. One would have 597(g3) instead of 597g3.

Mr. Dewey's solution, however, can be criticized because the mixture of numbers and letters removes from the classification its decimal and numerical character in which lies both its simplicity and its universality. Thus, we have attempted to achieve an identical result using numbers by proceeding in the following manner [7].

Various categories of auxiliary indices are borrowed from corresponding classification numbers and are placed between parentheses. They would be given an exponent corresponding to the main series of numbers. Let (. . .⁵) be the index for geologic time and (. . .⁴) the language index, then 598.2 (7⁵) would represent birds of the Cretaceous period and 220.5 (917⁴) would represent Russian translations of the Bible, for 551.77 is the classification number of stratigraphic geology of the cretaceous period and 491.7 is the classification number for Russian philology.

In this proposal, the [:] (*sic*) would continue to indicate modification by a main classification number, and the parentheses given an exponent would be reserved to

[7] For the numerous divisions which constitute an enumeration rather than a classification into branches and sub-branches, it has been proposed to replace decimal division by division into 100ths. This division would actually give 80 new headings and not 100, for 01, 02, . . . , 09 and 20, 30, 40, . . . , 90 would not be used so as to avoid confusion with indices of form expressing generalities. We would then have 546, 546.11, 546.12, 546.19, 546.21, etc. It is simpler to proceed thus than by underlining the numbers which are to be treated as whole numbers and not as decimal numbers, as in the following example: 546.1, 546.2, 546.9, 546.10, 546.11, 546.12. Absolutely decimal notation for dates of the year can be formulated. The months would be indicated by 01, 02, 03, . . . , 11, 12 and the days, 01, 02, 09, 11, . . . , 31. The 7 March 1895 would be written (1895.03.07). This notation would be useful in History for subdivision by day of the month in certain troubled times, such as revolutionary periods and for the history of certain military campaigns. Then, it is true, the 0 is being given a sense other than that of the generalities; it has the sense of "nothing," but no confusion need be feared. Because of the parentheses and the figures which precede it, there should be no inconvenience in using it.

indicate only auxiliary divisions by time and place. The auxiliary geographic index is actually borrowed from the geography of each country.

- | | | |
|-------|----------------------|------------|
| 91.4 | Geography of Europe, | (4) Europe |
| 91.54 | Geography of India, | (54) India |

Now, the numbers 910 to 913 not being used to indicate the geography of any country, the symbols in parentheses, (1) (2), are available. Thus (1) and its divisions could be used for the chronological index suggested by Mr. Dewey thus:

- (11) = B.C.
- (17) = 18th Century¹²
- (1854) = 1854
- 327 (15) = international politics in the 16th century.

The index (2) would indicate all the subdivisions of physical geography as given by Mr. Dewey:

595 (27) = Lake fish

Now, as we have said, because the historical divisions for each country have numbers symmetrical with those of geography, the auxiliary geographical indices could be extended by the historical divisions. Therefore, if we have

- 91.44 Geography of France
- (44) France (Auxiliary index)
- 9.44 History of France
- 9.44.05 History of France at the time of the Revolution
- (44.05) France at the time of the Revolution (auxiliary index)

combinations like the following become quite clear:

595(27:44) French lake fish
 595(44:27) French fish: Lakes.

In addition, direction would be indicated by universally understood letters of the compass: Geography of the North of France, 91 (44N).

Such a solution is still incomplete. It certainly provides a principal modifier for all the divisions which return only infrequently and also for some auxiliary indices which express uniformly the most generally used categories. It leaves unsolved the third problem: divisions which recur frequently in the same branch of the classification. Now, the classification of any branch of science nearly always gives rise to a double approach. The one involves concrete entities (such as minerals, plants, animals, peoples, languages); the other involves abstract and synthetic points of view (physiology, anatomy, embryology; lexicography, morphology, prosody, etc.) or put schematically:

59 ZOOLOGY	591.1 PHYSIOLOGY a	591.2 PATHOLOGY b	591.3 EMBRYOLOGY, ETC. c
592 Invertebrates A			
593 Protozoas B			
594 Molluscs, etc. C			

For this double approach in which combinations are as frequently a:A as A:a, the modifier is sufficient. That is, 591.1:592 and 592:591.1 are perfectly intelligible. Nevertheless, the expression is a little long and it would be very desirable if the terminology of each of the sciences, especially if they have been the object of a convention generally accepted by scholars, could be formulated concisely [8]. Now, it is necessary to understand here that the point of view of the encyclopedist should be defended as well as that of the specialist. It is absolutely necessary in a Universal Bibliographic Repertory not to let the same number have several meanings. All confusion would appear to be avoided if, on the one hand, in order to distinguish them from those of time and place, the numbers expressing the classified terminology of each science were derived from .0 (*sic*) and placed between parentheses, and, if, on the other hand, all the parallel nomenclature indices derived from 0 (*sic*) were kept distinct from each other by prohibiting their use outside the science from which they are drawn and which provides the context for their interpretation.

Consequently, in Astronomy, for example, one would have the following nomenclature for heavenly bodies:

- | | | | |
|------|-------------|-------|-----------------|
| (01) | The Sun | (031) | Mercury |
| (02) | The Moon | (032) | Venus |
| (03) | The Planets | (09) | The earth, etc. |

Then, 525 physical astronomy; 525(01) Physical Astronomy of the Sun; 525(031) Physical Astronomy of Mercury.

In pathology, for example, one would have, the terminology for diseases:

- | | |
|-------|------------------------------------|
| (01) | Diseases of the Circulatory System |
| (012) | Diseases of the Heart |
| (02) | Diseases of the Respiratory System |

[8] In a great many sciences, such as chemistry, photography, electricity and anatomy, the nomenclature has been fixed by international congresses.

615.218 (012) Effects of phosphorous on the treatment of diseases of the heart [9]

When several kinds of terminology are used in the same science - as in medicine where there is a terminology for diseases, for medicines, for areas, or in chemistry where there is a nomenclature for elements and one for organic chemistry - they can all be derived from (0). For example:

- (01) Nomenclature of the elements
 - (0111) hydrogen
 - (0112) chlorine
- (02) Nomenclature of organic chemistry
 - (021) alcohols
 - (022) esters

Finally, when it is necessary to use terms outside of their respective sciences, the number of the science from which they have been taken can be placed in parenthesis as an exponent. Thus, for example, one would write: 368.42 (012⁶¹) = Conditions of health insurance for those with heart conditions. Nevertheless, in this case it is yet to be seen whether the simpler form of the principal modifier would be preferable: 368.42:616.12.

In summary, the decimal classification must constitute both a classification and a bibliographic notation. As a classification, it must present a framework in which ideas can be successively subordinated to each other in different ways, according to whether they are assigned a superior position or a subordinate one. As a bibliographic notation, it must become a veritable pasigraphy able to interpret by numerals grouped into factors having a separate and permanent meaning, all the nuances of ideologico-bibliographic analysis. These factors will delimit the principal idea by means of an auxiliary idea, this being sometimes another principal idea borrowed whole from some other branch of the classification, sometimes a bibliographical category in very general use, such as the auxiliary indices of time, place, language, etc., sometimes the very nomenclature of the sciences being dealt with.

The various combinations of these different factors will between them also dispense with the necessity of creating new classification numbers each time that it might be useful to classify the same bibliographical notices according to different points of view. Thus, the encyclopedic requirements of the Universal Bibliographic Repertory can be reconciled with the necessities of special bibliographies.

Bibliographic classification has problems which differ from science to science. These special needs have now been the object of a very great number of studies, knowledge of which will profit those who at this time are studying the developments

[9] M.M. Carus (Leipzig), Christie (Greenwich) and Baudouin (Paris) are agreed on the utility of these nomenclature indices drawn from each branch of the classification, but the notation that they propose does not take sufficient account of the view of the encyclopedist who must prohibit the attribution of the same notation to different ideas.

which must occur in the decimal classification. Here are the titles of some of these studies:¹³

Bibliographie. - LARNED, *Library Journal*, 7:129

Art. - CUTTER, *Library Journal*, 7:168:72 and CARR,

LL.J., 9:172-75.

Geographie - CUTTER, *L.J.* 9:115-16.

Bibliography, Lamard: J.N. Larned, "Bibliography," *Library Journal* 7(1882): 125-130

Art, Cutter and Carr: C.A. Cutter, "Classification of the Book Arts" *Library Journal* 7 (1882): 168-172; H.J. Carr, "Classification and Notation of the Book Arts," *Library Journal* 9 (1884): 172-175

Geography, Cutter: [Unsigned editorial by C.A. Cutter on J.N. Larned's scheme -- see "Sociology, Larned," below]. *Library Journal* 9 (1884): 115-116

Folklore, Cutter, Noyes, Richardson and Bless (*sic*) and Wheatley: C.A. Cutter, "The Place of Folklore in a Classification: a Problem," *Library Journal* 9 (1884): 136; S.B.N. "Classifying Folk-Lore and Shakespeariana [a paragraph in the section, "Communications"]," *Library Journal* 9(1884):156; E.C. Richardson, "Folk-Lore Again [a paragraph in the section, "Communication"]," *Library Journal* 9(1884):177; R. Bliss, [untitled paragraph added to the foregoing]; Henry B. Wheatley, "The Place of Folk-Lore in a Classification," *Library Journal* 9(1884):188-189

History, Lomax: Benjamin Lomax, "On the Classification of History." *Transactions and Proceedings of the Third Annual Meeting of The Library Association of the United Kingdom, held at Edinburgh, October 1880.* London: Chiswick Press, 1881. pp 67-68

History of France, Tedder following Monod: Henry R. Tedder, "The Bibliography and Classification of French history ["the title of the work I have to speak of is Bibliographie de l'Histoire de France: Catalogue méthodique et chronologique des sources et des ouvrages relatifs à l'histoire de France depuis les origines jusqu'en 1789 par G. Monod...]," *The Library* 1(1889): 15-23

Law, Laue (*sic*): W.C. Lane, "Report on Classification, 1883-85," *Library Journal* 10(1885):257-262

Library Economy, Cutter: C.A. Cutter, "Classification of Library Economy and History," *Library Journal* 7(1882):271

Mathematics, Lord Lindsay: Lord Lindsay, "A Proposed Modification of the Amherst Classification in Mathematics, Astronomy and Physics," *Library Journal* 4(1879):149-152

Pure Mathematics, Rowell: J.C. Rowell, "Classification of Pure Mathematics," *Library Journal* 17(1892):447

Natural Sciences, Cutter and Trail: C.A. Cutter, "A Classification for the Natural Sciences," *Library Journal* 5(1880):163-166; James W.H. Trail, "The Classification of Books in the Natural Sciences," *The Library* 6(1884):13-18

Philosophy, Cutter and Larned: "Two Classifications of Philosophy 1. C.A. Cutter, 1879," *Library Journal* 10(1885):79-80; "Two Classifications of Philosophy 2. J.A. Larned, 1884," *Library Journal* 10(1885):80-82

Recreative Arts, Cutter: C.A. Cutter, "Classification of the Recreative Arts and Athletic Arts," *Library Journal* 10(1885):6-7

Sociology, Larned: J.N. Larned, "A Nomenclature of Classification," *Library Journal* 9(1884):62-69

Theology, Richardson: E.C. Richardson, "Classification of Theology," *Library Journal* 8 (1883): 320-321

Zoology, Mann: B. Pickering Mann, "Zoological Subjects Partly Classified by the Dewey System," *Library Journal* 5(1880):143-144

Literature, Thomas: E.C. Thomas, "Classification of Literature," *Library Chronicle* 1(1885):181-183

Folktales, Cutter: C.A. Cutter, "Classification on the Shelves," *Library Journal* 6 (1881): 64-69

Bibliography of Shakespeare, Cutter, Noyes and Tedder: C.A. Cutter, "Arrangement and Notation of Shakespeariana," *Library Journal* 9(1884):137-139; S.B.N., "Classifying Folk-Lore and Shakespeariana [a paragraph under the heading, "Communications"]," *Library Journal* 9(1884):156; Henry R. Tedder: A Classification of Shakespeariana," *Library Journal* 11(1886):441-442 [outlines scheme] and 449 [summary of paper on the subject].

Also Consult¹⁴

- Samuel H. Scuder, "The Arrangement of Books in the Libraries of Scientific Societies," *Library Journal* 12 (1887): 221-224.
- James Blake Bailey, "On Classification for Scientific and Medical Libraries," *Library Chronicle* 3 (1886): 109-114.
- Borden, "Classification of Photographic Collections" *Library Journal* 17(1892): 195-197
- Henry B. Wheatley, "Thoughts on the Cataloguing of Journals and Transactions," *Transactions and Proceedings of the Fourth and Fifth Annual Meetings of the Library Association of the United Kingdom, London, September 1881 and Cambridge, September 1882*. London: Chiswick Press, 1884. pp. 190-196.
- Henry R. Tedder, "Proposals for a Bibliography of National History [read at the Annual Meeting of the Library Association, Plymouth 1885]," *Library Chronicle* 3 (1887): 185-194.
- F. Madan, "What to Aim at in Local Bibliography [read at the Annual Meeting of the Library Association, Birmingham 1887]," *Library Chronicle* 4(1887):144-148
- F.B.F. Campbell, "An Introduction to the Theory of a State Paper Catalogue [read at the Annual Meeting of the Library Association, Reading, 1890]," *The Library* 3(1891):126-143
- Talbot B. Reed, "Use and Classification of a Typographical Library [Read at the Annual Meeting of the Library Association, Nottingham 1891]," *The Library* 4(1892):33-44
- W.M. Chase, "A General Engineering Classification and Index: Some Possibilities in the Extension and use, by the Engineering Professions, of the Dewey Decimal System," *Transactions of the American Society of Mechanical Engineers* 14(1893):780-805

Editor's Notes

1. P. Otlet, "Sur la structure des nombres classificateurs," *IIB Bulletin* 1 (1895-96): 230-243. This article is followed by one unsigned on how to prepare papers and journals in such a way as to assist the bibliographer in his work, particularly by assigning decimal numbers: "Indexification décimale: règles pratiques et modèles," *IIB Bulletin* 1 (1895-96): 244-249.
2. Victor Carus, "La Zoologie et la classification décimale," *IIB Bulletin* 1 (1895-96): 189-193.
3. Marcel Baudouin, "La Classification décimale et les sciences médicales," *IIB Bulletin* 1 (1895-96): 166-181.
4. Daruty de Grandpré, "La Classification décimale et les bibliographies régionales: bibliographie des îles africaines de l'océan indien austral," *IIB Bulletin* 1 (1895-96): 205-221.
5. G. Simoëns, "Quelque mots à propos de l'analyse bibliographique," *IIB Bulletin* 1 (1895-96): 222-229.
6. Otlet refers here to a note headed, "The International Conference of the Royal Society" and signed by Henry Armstrong, Chairman of the Organising Committee which was printed in *IIB Bulletin* 1 (1895-96): 182-188. Armstrong sets forth matters that an international conference on an international catalogue for scientific literature would need to consider. He particularly addresses the problem of the decimal classification adopted "en bloc" by the IIB, suggesting it will need substantial modification if it is to serve the purpose of an international scientific catalogue. He provides a lengthy specimen of entries classified by the Decimal

Classification, suggests it has "very great" advantages, but indicates that "no attempt has been made as yet to bring the different schemes into harmony."

7. Otlet's first footnote refers to "Création d'un Répertoire Bibliographique Universel: note préliminaire" translated above. A translation of the work he mentions in his Footnote 2, "Règles pour les développements à apporter à la Classification Décimale" follows as No. 4 in the present volume. Otlet misnumbers the footnotes in his text as 2 and 3 (rather than 1 and 2).
8. Teratology is "the study of monstrosities or abnormal formations in animals or plants." (*Oxford English Dictionary*).
9. Pasigraphy is "a name given to a system of writing proposed for universal use, with characters representing ideas instead of words, so as to be (like the ordinary numerals 1, 2, 3, etc.) intelligible to persons of all languages." (*Oxford English Dictionary*).
10. Otlet refers to his "Le Programme de l'Institut International de Bibliographie: objections and explications," *IIB Bulletin* 1 (1895-96): 73-100. In the passages indicated here he suggests that any classification number can be made yet more precise by the use of the form division indicated by 0, by a geographical subdivision indicated by a number in parentheses and drawn from the divisions of geography with the 91 suppressed, and by chronological subdivisions combined with those for geography. He does not in these pages discuss the use of the colon, :.
11. Otlet refers to, "Le Programme de l'Institut International de Bibliographie: objections and explications," where he says: "... a synthetic reading [of numbers] is singularly facilitated by the fact that the sense given to each component is permanent and absolute, identical in all of the combinations of which it becomes part . . . Bibliography finds in the numerical symbols of the decimal classification a notation assuredly as clear and as practical as the notation of algebra or chemistry."
12. The text gives(15) for the 18th Century. This presumably is a misprint and should read (17) as shown.
13. The first three references are in the sketchy form given by Otlet. They are followed by full references that have been verified, each preceded by the subject and author form given by Otlet. Otlet's citations in this section frequently contain mistakes of various kinds and these have been corrected.
14. The entries in this section have been identified, corrected, rearranged slightly and complete bibliographic details provided. The abbreviated citations to American and English sources (and the errors) must have made following up most of these references very difficult for European readers of the time.

4. RULES FOR DEVELOPING THE DECIMAL CLASSIFICATION¹

Several parts of the Decimal Classification must be developed and enriched by new divisions. This work has begun under the direction of the International Office of Bibliography which has sought collaboration from several scholarly groups. The Office centralises and considers for approval all the proposals for modification that are submitted to it. It is for these collaborators that we have assembled here a few notes and some advice on how to go about choosing new divisions so that the necessary consistency will be maintained between all parts of the classification. We ask that these observations be examined carefully.

New divisions should be created only in full knowledge of the situation. Thus it is important to re-read what has been published on the Decimal Classification in the *Bulletin* of the Institute and in Mr. Dewey's preface to the American edition. Any theoretical account being of little value without concrete examples, we refer to the developed tables of the Decimal Classification which have been published for Philosophy² and Sociology.³ Their application may be checked in the various bibliographies that have already been published: *Bibliographia sociologica*, *Bibliographia philosophica*, *Bibliographia astronomica*.⁴

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Before the location for a new number is selected, the alphabetical index of the Decimal Classification should be checked to make sure that the subject has not already been assigned. The index ensures consistency between all parts of the classification.

Given the decisions of the Brussels conference, so that past uses of the classification and future uses can be kept rigorously consistent, no numbers of the Decimal Classification that already exist should be modified.

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A bibliographical classification is different from a strictly scientific one in that its objective is quite practical: to arrange bibliographic entries in such a way that where they have been placed can always easily be found either by the person doing this work or by the person who must consult them. It follows that a bibliographic classification can depart from an exact scientific order without the principles of the classification being compromised. Moreover, because such a classification must be useful for a subject catalogue, one must be aware that to a certain extent it is not ideas themselves that have to be classified but entries for the books and journal articles that deal with these ideas. Consequently, while there are quite distinct subjects that ought to have their own place in

a theoretical classification, a separate place in a bibliographical classification for them is pointless while there is nothing, or next to nothing, written about them. In other words, a bibliographic classification is not a pure classification of knowledge, but such a classification in relation to bibliographic entries [1]

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In order to create an exhaustive classification, the following rules, appropriate to all classifications, should be kept in mind:

- a complete enumeration of the objects to be classified;
- an examination of the specific characteristics of these objects;
- choice of one of these characteristics as the basis of classification; the subordination of other characteristics to this;
- arrangement of objects in classes and subclasses by proceeding from the general to the specific and from the simple to the complex.

Difficulties arise because any object has many characteristics and consequently many possible classifications exist. In order to decide what characteristics to take as the basis for classification, the following observations should be kept in mind:

1. The objects of knowledge are both material entities belonging to the physical world, such as minerals, plants, scientific instruments, written languages, etc., etc. and intellectual entities, ideas, concepts. These two kinds of objects can be considered from two points of view. From the first point of view they can be envisaged as complete in themselves, as autonomous, as a totality, as a concrete whole. From the second point of view, they are envisaged in terms of their relations with other objects or as parts of an abstract entity.

While a classification always involves the abstract point of view and deals with objects in their relationships with each other, it is nevertheless necessary to be aware that the two points of view constantly interact. For example: plants can be considered from the point of view of morphology, physiology, economics and geography. A country can be considered from the point of view of climate, geography, administration. Biology studies the same phenomena in all the orders of being: plants, animals, man.

To be complete, a classification should, therefore, enumerate both the objects and the points of view and choose as the basis of classification a sequence of one or the other as needs be.

2. The sciences, however, traditionally develop in a way that does not allow such clear distinctions. It is necessary to be aware of this in Bibliography, as in Education, because it is on this development that the professional specializations are based that so strongly influence the composition of the sciences themselves.

3. Because it is to be used for a Universal Bibliographic Repertory, the classification must be considered as a whole as well as in terms of its parts. If it were only a question of developing a classification for each separate branch of knowledge

[1] See what has been said on this subject in the *Bulletin* of the Institut International de Bibliographie, p. 86.⁵

without regard to the whole, then the tables for the classification of Chemistry, for example, would comprise not only pure chemistry but all the auxiliary and related sciences - applied chemistry, the general principles of physics, physiological chemistry, etc. On the contrary, the bibliographic repertory is unitary and its various parts support each other. As far as possible, therefore, to continue the example, there will be only one heading for chemical physiology to be used both by chemists and physiologists, a single photographic chemistry for photographers and chemists.

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In the developments that the Decimal Classification must undergo, it is necessary to be aware of the following two ideas: to make the system as mnemonic as possible by using the same numbers or parts of numbers to express the same ideas; and to establish a symmetrical correspondence between the subdivisions of the various parts of the classification by taking the subdivisions of one part and making them serve as the divisions of another part.

As to the first point, there are numerous applications of it in the existing classification. Thus, history as a discipline is indexed as 9. The history of a discipline is indicated by the form number 09: the same number has the same meaning.

As to the second point, one can see how the developments of philology have followed those of literature. In botany and zoology, the divisions 581 and 591 are symmetric. In medicine, there is a nearly absolute agreement between Anatomy, Physiology, Hygiene and Pathology. For example:

61	Medicine
611	Anatomy
611.8	Anatomy of the Nervous System
612	Physiology
612.8	Physiology of the Nervous System
613	hygiene
613.8	hygiene of the Nervous System

In relation to these ideas, it may be noted that:

1. Nearly all of today's disciplines develop according to the comparative method. This is notably true for Biology, Philology and Law. These disciplines, therefore, have fundamental divisions that are both common to each of them as a whole as well as to each of their component parts. Every language has, for example, grammar, syntax, lexicography, phonetics. This comparative approach must be preferred in the classification and the numbers of the classification must be arranged in such a way that the comparative subdivisions for points of view can be used, unmodified, as subdivisions for each concrete element. An example is provided by the divisions for Philology (4), where 41 is Comparative Philology. All the divisions of 410 recur, with substantially the same numbers, in the divisions for the Philology of each individual language.

2. When developments that are symmetrical and in agreement have been created, it is necessary to consider which aspect of a subject is to be accepted as the

principle focus for the subject in preference to other aspects which will be subordinated to it for development. For example: the internal administration of a country is divided according to the objects administered at 351.7. But there exists an international administration whose domain is growing ever larger. It is possible for Public Welfare, Unemployment and Vagrancy, Currency etc. to be the object of both national and international action. Therefore, all divisions of 351.7 have been repeated as divisions of 341.27 as objects of international administration. Several of these divisions, given the present state of international law, will not be useful and they will be left empty. On the other hand, divisions that do not exist already at 351.7 will not be created at 341.27 because the former number is treated as the focus for the subject. Other numbers for comparison: 341.2, 347 and 351.7; 347.7 and 347; 351.77 and 614; 351.83 and 331.

3. A consequence of this rule of symmetry and parallelism is that it is important to make complete enumerations even if a particular number is not used. It is sufficient that a division should be necessary in certain places for it to become in theory generally valuable, even though it may not always be used. Thus the divisions of Physiological Zoology will be developed at the outset for all species without regard to whether this or that function is characteristic of them all or only some. To begin a special subdivision for each species would be to introduce needless complication. Similarly, there exists only one series of divisions for Paleontology (56) on the one hand, and Botany (58) and Zoology (59) on the other.

4. There should be a similar concern for the future. There are many divisions that are not useful for the bibliography of today's knowledge but which will become useful for tomorrow's. Rationally, to all intents and purposes such divisions can be said to exist already. It is necessary, therefore, to indicate what they are and to develop the classification in such a way that it will be able to accommodate them easily in the future.

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Some specific rules follow:

A) When it is necessary to introduce a new subject in the classification, an available tenth is used.

B) When there is no longer an available division, one looks for an already classified heading to which the new subject is closely related. The existing heading is given a more general meaning that embraces the old and the new idea. Subsequently, the decimal subdivisions are developed at this heading.

For example: The number 341.2 was assigned to international treaties. As there was no place for detailed studies about international administration, this classification number was given the collective meaning "states, territories, international relations, treaties, international administrations." The following divisions were created:

341.21 States or Persons in International Law

341.22 Territories or Things in International Law

341.23 Essential and Reciprocal Rights and Duties of States

341.24 Treaties which Supplement and Modify these Rights and Duties

In this way treaties properly speaking are no longer the only part of 341.2 (another example for comparison: 339 Pauperism).

C) When a subject has more than 9 divisions and when it is not possible to bring two or more subjects together into a collective grouping, all the subjects that are left over are placed at the ninth division under the heading "Other" - see the *Bulletin*, p.89.⁶

D) When the divisions are numerous and constitute an enumeration and not a classification into branches and sub-branches, the decimal division into 10 can be abandoned in favour of division by 100ths. This division then yields 80 new numbers not 100, because 01, 02 to 09 and 20, 30, 40...90 must not be used in order to avoid confusion with the form numbers used for generalities - consult the development of the number 119 in the tables for philosophy in *Bibliographica philosophica*.⁷

E) If one decides that a subject would be better classified at another place, there is nothing to prevent it being relocated and given a new number. The old number is not suppressed but remains unused. A reference is made from one number to the other and this bilocation gives much flexibility to the system. Too many places for the same subject should be avoided.

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In order to make an exhaustive listing, one or other of the following procedures is used:

- a) one works experimentally by trying to classify already collected bibliographic references.
- b) one compiles a classified index for general treatises.
- c) one collects all the words from the indexes of these treatises, from technical encyclopedias or from other bibliographies. Because journal articles always deal with more specialized subjects than books, it is useful to prepare a classified index for technical journals.

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One of the principal merits of the Decimal Classification is its simplicity. It is important to preserve this quality, especially from the point of view of combining numbers and using parts of the tables.

The combination of numbers, which has been discussed in the note on the rules for the Decimal Classification, involves the geographic index, the history index, the form indices and whole number specification (see *Bulletin*, p. 90).⁸ Thoughtful use of these numbers can extend the use of the Decimal Classification without creating new numbers. To cite only one example, all the scientific applications of photography will be classified at the number 778 which can be modified by any specific number. Thus, the application of photography to the stars, 778.52, etc. These complementary numbers should be added to the pure radical of the classification number as much as possible. This is simpler and more mnemonic. For example:

Public Finances	336
<i>idem</i> in France	336 (44).

It is necessary to avoid saying - because this would be unnecessarily complicated:

Public Finances	336
<i>idem</i> in different countries	336.1
<i>idem</i> in France	336.1 (44)
Budget	336.2

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To repeat what has been said about symmetrical and parallel developments, we stress the importance of choosing from possible numbers those which allow the greatest future development and which are easiest to use in combinations. Several examples of this can be found in the present Decimal Classification:

01 Bibliography	
015 Bibliography by Country	
016 Bibliography by special subject (e.g.	
016:52 bibliography of astronomy).	

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In a general way, when a new number or a new combination of numbers is to be created, it is necessary to have a mental picture of the exact place the bibliographic card that is indexed by the new number will occupy in a catalogue. For example, it is a matter of some importance whether literature is indexed on the basis of country then by genre for each country and then by periods for each genre, as opposed to periods for each country and then genre. Thus:

French Literature:

Poetry,	18 century 19th century
Drama,	18th century 19th century
Rhetoric	18th century 19th century

or

French Literature:

18th century,	Poetry Drama Rhetoric
19th century,	Poetry Drama Rhetoric

In the first instance, all French poetry is brought together as is all of theatre, and the divisions by genre precede those by period. In the second instance, the dominant idea is to group the works of one period. When developing the tables, one must decide in each individual case which idea should be primary and which secondary.

Editor's Notes

1. Office international de Bibliographie. *Règles pour les développements à apporter à la Classification Décimale*. Bruxelles: OIB, 1896. 13 pp. This is unsigned.
2. Referred to here, presumably, are the "Tables Méthodiques de la Classification Décimale" which appeared in the February 1, 1986 issue of *Sommaire idéologique des ouvrages et des revues de philosophie* published as a supplement to the *Revue néo-scholastique*. (See also Editor's Note 44 to Paper 2, "Creation of a Universal Bibliographic Repertory...") These tables and the "Introduction" which precedes them are interesting in showing ways in which it was decided to proceed practically to fill in gaps in Dewey's tables or re-order subjects where he had not been "strictly logical". Related matters were to be brought together at one number which would thus have enlarged signification (for example, 165 Sources of Error was also to be used for Criteriology). This procedure is discussed later in this paper. A Dewey number would be accepted but extended (Dewey's 149.9 would become 149.911). Finally, the idea of one number "determining" or "modifying" another was described, and indeed, a combined number was shown in sequence in the Tables: 15:612 Physiological Psychology followed by 150 Psychology and its form divisions. A footnote explained "one number can determine another by the use of the sign: ...15 indicates Psychology; 612 (with all of its divisions) Physiology; the whole expression 15:612 Psycho-physiology."
3. The Sociology Tables were published in 1895 as *Decimal Classification: Sociology, Sozialwissenschaft, Sociologie. Tables méthodiques et alphabétique...* (See Editor's Note 38 to Paper 2, "Creation of a Universal Bibliography....").
4. For an account of the *Bibliographia sociologica* and *Bibliographia philosophica* see Editor's Notes 43 and 44 to Paper 2, "Creation of a Universal Bibliographic Repertory..."

Fascicule I of the *Bibliographia Astronomica: Astronomie, météorologie, géodesie, physique du globe. Sommaire méthodique des traités et des revues dressés conformément à la Classification Décimale* appeared in 1895. It was sponsored by the Library of the Société Belge d'Astronomie and published by the OIB and George Bolat to whom bibliographic matter was to be sent for incorporation into the index. The actual "Sommaire" or bibliography is only 4 leaves long, with entries only on one side of the page to facilitate their "transfer to separate cards... which explains the blank pages in our issue." The introduction describes the Classification and the overall objectives of the OIB. The divisions for Astronomy are then listed on pages 1-10. It is not clear how much more, if anything, was published in 1895 of this very slight work (The Editor has seen only this single issue). In 1897 an attempt was

made to take the bibliography up again. An introductory or specimen issue appeared in which the *Bibliographia Universalis*, the Decimal Classification, and conditions of subscription to the *Bibliographia astronomica* were described. A first issue was then published marked January–February 1897. The OIB and Bolat are again shown to be associated in the publication. Again it is not clear if anything more appeared.

5. Otlet refers here to his discussion of this point in "Le Programme de l'Institut International de Bibliographie: objections and explications," *IIB Bulletin* 1 (1895-96): 73-100.
6. Referred to is "Le Programme de l'Institut International de Bibliographie..." where Otlet observes that, "after having given the first eight numbers to the first eight divisions, one gives to the 9th the meaning 'other subdivisions of the same subject' and the remaining subdivisions become 91, 92, 93, 94 etc." He gives an example from 914, the geography of Europe:

914.1	Scotland
914.2	England
914.7	Russia
914.8	Scandinavia
914.81	Norway
914.82	Sweden
914.9	Other Countries of Europe
914.91	Iceland

7. There is some confusion in this reference. In the "Tables Méthodique" given in the February 1896 issue of the *Sommaire idéologique...de philosophie*, 119 is the number for Quantity and has no further division. Number 191 is for Modern American Philosophers. It is broken down by individuals; for example, 191.3 is Ralph Waldo Emerson. The enumeration does not continue beyond the 9, but follows the rule for division if there are more than 9 divisions described in the preceding footnote. Thus, 191.9 is Other American Philosophers. The entries in the *Sommaire* itself show that this number is not further subdivided to enumerate the other American Philosophers. Otlet's footnote [7] to "On the Structure of Classification Numbers" (Paper 3 in this volume) is relevant here.
8. Referred to here is Otlet's "Le Programme de l'Institut International de Bibliographie..." He discusses combinations with form and geographical numbers and how to derive the number 537.09 (44.04) - history of electricity at the time of the French Revolution. Otlet does not here discuss what I have translated as "whole number specification" involving use of the colon in the related discussion in the previous paper "On the Structure of Classification of Numbers".

5. THE SCIENCE OF BIBLIOGRAPHY AND DOCUMENTATION¹

The world's most important character, who has been discussed for perhaps three thousand years in turn as a giant or a pygmy, conceited or modest, sometimes bold or timid, knowing how to assume all forms and all roles, capable in turn of enlightening or clouding minds, of moving the passions or of calming them, creator of factions, conciliator of parties, a veritable Proteus whom no definition can capture - this personage is the Book.[1]

Does there exist for the extraordinary being thus described, who appears successively behind the exteriors of millions of volumes, brochures, compendia, reports and journal articles, each reproduced in thousands of copies, a body of systematic knowledge, a well organised discipline? What is this discipline called? How is its subject defined, delimited, divided up?

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Inappropriate terms lead to erroneous or imperfect conceptions. When one consults any dictionary taken up by chance, one reads: "BIBLIOGRAPHY (*Biblion*, book, graphô, I describe), Science, knowledge of Bibliography; BIBLIOGRAPHER, one who is acquainted with books, editions, etc." The vagueness of such notions is striking. Not having a precise definition, one must first of all find out what knowledge of the book has involved up till now.

If one proceeds empirically one can divide the works which have dealt with this subject into several large classes. The first class of works is addressed to technical persons and deals with the making of paper, type-fonts, the printing of books properly speaking, the industry and commerce of books: that is to say, with all that is concerned with printing, publishing and the book trade.

In the second class, the *History of the Book* is studied by going back to its origins in the invention of writing and then, whether written on papyrus, parchment or paper, whether written by hand or printed, by tracing its various developments among the peoples of the Orient, Greece and Rome, to the Middle Ages, and up to the modern period. Works on the history of printing are the most important in this class.

A third class of books deals with *library economy* or with the techniques of libraries, institutions whose purpose is to preserve works and to make them available to readers. Here it is mainly a matter of the physical installation of libraries, organisation, administration, their relations with the public, and of the classification and cataloguing of materials, etc. Certain works under the name *Library Ecography* [biblioécographie] deal with the description of particular libraries.

[1] E. Egger, *Histoire du livre depuis ses origines jusqu'à nos jours*, Paris, Hetzel, p. vii.

A fourth class of works deals with *Bibliophily*. Here it is not a matter of book production, systematic description, preservation, or use. Rather, the book is considered solely as a precious and rare object, worthy of being collected in the same way that paintings, engravings and curios are collected.

A fifth class is directed towards a special public concerned with artistic matters. Here illustrators, designers, water colourists, and engravers are studied: that is to say, everything connected with the graphic decoration of the book and its binding [2].

A sixth class of works deals with *bibliographical techniques* properly speaking: that is to say, methods of describing works and forming bibliographical catalogues as well as organising the institutions responsible for their care.

A seventh class of materials comprises all *bibliographical works* themselves: that is to say, bibliographical repertoires of all kinds and descriptive lists of books.

If some strict rule determined the formation of scientific terms, the word *bibliology* would long ago have taken its place beside *bibliography*. As a general name it would have included all of the various subjects which deal with books. Thus it is that "philology" comprises all that bears on the study of language, "sociology" all that deals with the study of societies, "technology" all that touches upon industry and the mechanical arts.

Rationally the term *bibliology* ought to be defined as: *the science of the book, or the whole of our knowledge relative to books*. Unfortunately, the term has been frequently employed in a restricted sense. It cannot replace the term *bibliography* [3] because this already has a special sense which leads to confusion as one has just seen: its etymological formation has led to it signifying aspects of subjects rather than the theoretical aspects of knowledge about the book.

Because there is no generic, logically-formed name, all of our knowledge relating to the book has sometimes been placed under the heading, "Science of the Book." But this expression is itself inexact and of a kind to cast doubt on the precise subject of this knowledge, for the word, "book", in its strict sense does not include periodicals or newspapers or separately printed leaves or cards. None of the appellations proposed up till now, therefore, appears adequately to express the subject of the knowledge with which we are concerned.

Apart from any question of terminology, preliminary to it even, is the very real need to determine in a rational way the structure of the discipline that embraces all of what we know about the book and to systematize a few of the subjects that it includes.

Some difficulties, common to all studies of this kind, appear at the outset. To define a discipline, to delimit its subject, is above all to establish its relations with other disciplines. It is, in the final analysis, to undertake a task of classification. Now, needless to say, all classification is naturally, in part at least, a matter of convention. It must be based on only one of the characteristics of the objects to be classified even though analytically there are an indefinite number of such characteristics. Objectively there exist only distinct objects or separate ideas. All links which we establish between objects or ideas bear the mark of

[2] See, principally, *Le Livre* by Henri Buchot.

[3] "Bibliography", said Ch. V. Langlois in his *Manuel de bibliographie historique* (Paris, 1896, p. vi) "is the science of books in contrast to *library economy* which deals with the classification and the physical description of books and the organisation and history of libraries, in contrast to *bibliology* which deals with the History of the Book from the point of view of its physical make-up (printing, binding, selling). Bibliography, in its strict sense, is that special part of the science of books which deals with catalogues and which furnishes the means of acquiring as promptly and completely as possible information about sources."

subjectivity. Thus, in a certain sense, it would be exact to say that the sciences are simply collectivities of what is known that can be shaped in very different and varying ways into self-contained bodies of doctrine.

Sometimes the mind takes the physical, concrete object as the basis of study and examines it from all points of view; sometimes, on the contrary, it deals with the ideal, abstract concept, with law or theory, which is examined in terms of all kinds and forms of relevant objects. Hence arises the principle of the sciences of objects and the sciences of ideas; but, in fact, most of the now developed sciences involve complex knowledge. They overlap each other and information related to them is often assembled in heterogeneous ways. Order can only be established by explicit or implicit agreement that is based on tradition, the decisions of congresses, the grouping of professions or the distribution of subjects among institutions of scientific research and teaching.

Given these general observations, we can now usefully examine the question posed. If one looks at things in a general way, one may observe that the book is only a particular case, a term derived from a series of notions which can be subordinated thus:

Knowledge or Understanding

Everything we know about objects in the external world or from our own thinking, physical objects (natural or artificial), non-physical objects (laws, thoughts, sentiments).

Graphic documents

Everything which expresses an element of knowledge directly (a known fact) by any graphic representation whatever (manuscripts or printed texts, inscriptions, epigraphy, drawings, iconography).

Writings

Those documents which represent knowledge by means of writing.

Printed works

Those written documents which are reproduced typographically or by analogous procedures of mechanical multiplication.

Books

Those printed works which are published separately and which contain a certain number of leaves devoted to the exposition of a single idea or a single group of ideas.

Numerous consequences flow from this subordination of ideas.

The science of the book cannot involve the study of the actual information contained in documents. This is a matter for the various individual disciplines. Knowledge is not identical with the documents which make it available and preserve its elements. It is quite

distinct, for it is a work of the human mind. Nevertheless, because the human mind is parcelled out into as many pieces as there are individuals, because it is not possible to gather together all who concern themselves with the same subject into a universal and permanent assizes, because man can only communicate his thought to man when not physically present, successively and by means of external signs, he has been forced to have recourse to the intermediary of innumerable written statements. The possibility of gathering these writings together, of blending and translating ideas, creates that permanence and simultaneity which ought to be typical of the human mind. Such are the role and function of conservation and transmission of thought which have devolved onto writing.

One should note that once produced, written texts can, in their turn, become objects of study and as such, inspire systematic knowledge based on what books have in common, once the subject matter with which they deal has been set apart. Our analysis, however, leads us in general to distinguish the book and the idea as form from substance, the container from the contents, and clearly to distinguish knowledge on the one hand from documentation on the other.

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Documentation should be distinguished with no less care from the *Organization of Knowledge*. This imprecise expression, which it is convenient to use in the absence of a unique term with a definite meaning, is here applied to the whole of the facts and considerations which are involved in the life and external organisation of knowledge itself, everything that has risen from creating it, preserving it, teaching it, disseminating it.

Knowledge has been defined as "the systematization of what is known on a given subject." The unity and inter-dependence of individual branches of knowledge have been recognised. A characteristic of universality through time and internationalism across countries has been proclaimed. As a corollary of these fundamental characteristics of human knowledge, it has been necessary to create an intellectual machinery for the simultaneous and continuous development of knowledge, to make effective the co-operation of scholars of different generations and of different countries and also to make general syntheses possible concurrently with analytical studies, to ensure that the progress of specialities keeps in step with the development of whole disciplines.

Following ever more detailed plans that reflect recent developments more effectively, we have witnessed each branch of knowledge organising itself separately at first, then we have seen organisations common to several areas emerge. What has been done, what exists today and what is projected in this area are considerable. To discuss this here would mean writing a treatise about the organisation of knowledge as a special discipline which in the future ought to be regarded as such. It would be analogous with respect to their external characteristics to general philosophy with respect to their internal conditions.

Let it suffice here to list some of the chapters of this treatise by mentioning some of the issues common to all branches of knowledge, or, to be more exact, the issues presented by each of them.

Because any subject is susceptible in principle of becoming a discipline or branch of systematized knowledge, all that is needed is for a certain number of persons to be sufficiently interested in its investigation for them to organise themselves for co-operation in research. Whereupon a scientific society is born which has these studies as its particular goal.

When societies having similar goals have been created in this way in different countries, they usually join to form an international association or institution which organises congresses or periodic meetings. Nearly all of these societies publish a *Bulletin* or *Proceedings* which they exchange with each other. These publications fulfil the double aim of making the work of their members known to others and, by providing an analysis of the work of those belonging to other associations, of keeping their members abreast of the general development of the discipline. Next, the "Year-book" of the discipline is born; that is to say, a compendium of general information on the subject it is concerned with and the names and addresses of persons and institutions dealing with it. The preparation of the special *Bibliography* of the field begins at the same time. This is sometimes published periodically in each of the *Bulletins*, sometimes collected and published as a whole in the *Year-book* or in a special publication. It is often taken up as a task by one of the societies in the group of those dealing with a particular field or by the international association that they have formed together.

Congresses devote themselves to the discussion of scientific problems in the field, matters on which no vote is taken. Congresses also discuss the organisation of work and this does become the object of decisions and resolutions. What is involved here, indeed, is organisation and administration, an area where convention (rather than free scientific enquiry) plays the major role. Thus, scientific congresses deal with the standardisation and generalization of such matters as measurement, methods, apparatus and instruments, terminology and classification. They also discuss, support or undertake research requiring extensive co-operation and collective publications whose aim is the co-ordination of a great deal of information or a great many documents. This research and these publications could not possibly be undertaken by individual initiative alone.

The teaching of a discipline at all levels is also a matter for the Organisation of Knowledge: special professorships, practical courses and seminars, popular lectures, research institutes, and all the ways of encouraging the study of a science: competitions, study scholarships, travel scholarships, etc.

Finally, with all its faltering, its questioning, its observations, its discoveries, its discussions, its plans whether completed or just being formulated, knowledge taken as a whole produces as it unfolds thousands and thousands of graphic documents, principally books and journal articles. Dealing with these is of great concern to the Organisation of Knowledge: the composition and editing of works, their physical production, their preservation in libraries, listing and indexing them in bibliographical and reviewing publications, etc.

Such are the various subjects related to the *Organization of Knowledge* and which are studied in a comparative way. It is not limited to the examination of a particular discipline. Its investigations involve different disciplines, each of which is examined for what it has done best in these various areas. This is brought to the attention of specialists in other disciplines, and thus, gradually, a typical organisational structure is determined on the model of which in the future all new knowledge can be built.

As one has just seen, everything which deals with scientific documentation, can, in the final analysis, be considered as a branch of the organisation of knowledge. Nevertheless, because of its importance it is advisable to make this branch of study, like teaching, an independent and self-contained subject.

Not all documents are the province of the Science of the Book. It is necessary here to make some distinctions and to attempt some definitions. The sources of our knowledge, the documents on which it depends are: 1) the physical objects themselves, 2) monuments, 3) written sources.

In the first category of documents, it is necessary to include natural objects, specimens or samples of them, and non-graphic models or representations of them. These objects lead to graphic reproductions and to written works either about the objects themselves and the various matters related to them, or about reproductions of them.

Figurative documents include inscriptions, drawings and all works of plastic, decorative and pictorial art, monuments, antiquities, utensils, and various objects which principally are related to art, archaeology, epigraphy and iconography. These documents, like the physical objects themselves, also become the subject of graphic reproductions and written literary works.

Written sources comprise literary materials, archival documents, and all other writings. By *writings* is generally meant any document containing a transcription by means of the letters, words, and phrases of the spoken language. It does not matter much what the transcription is made on (paper, vellum, silk, etc.), or the instrument or the procedure by which it is performed (hand, typewriter, printing press), or the format in which the writing is presented (manuscript, printed volume, brochure, periodical article, separate sheet, card, etc.)

Literary works are artificially created written works - systems of facts and of ideas, scholarly statements or expositions, products of the imagination and sentiment - intended for the public and definable in one or several brief words (the title), which provides a summary of them and indicates exactly what they contain. These literary works are either handwritten or printed, and the printing is either from originals or from reproductions. As for news, casual information, news briefs, announcements, simple facts, they are of documentary interest, of course, but being reported in a fragmentary way and having involved no effort of synthesis, they are not literary works properly speaking.

Archival materials are official or private written documents produced in the course of the life or functioning either of an institution or an organisation (state, province, town, government service), or of a family or an individual. They are charters, diplomas, letters, diplomatic correspondence, laws, accounts, surveys, reports, forms, memoranda, etc. Archival documents or materials are sometimes in manuscript and unpublished, sometimes printed. Some of them were printed at the time they were created, as in the case of parliamentary documents and the contemporary publications of states; others have been printed at a later period than when they were produced, such as, for example, the publication nowadays of old maps and ordinances.

Other writings (notes of personal studies, autographs, correspondence), depending on circumstances, can become sources of information. Their mass is considerable; they have very little general interest except when circumstances happen to place them in the category of archives.

Which of these diverse kinds of documents are within the scope of the Science of the Book and by what signs do we recognize them as such? It is not possible theoretically to find an absolute criterion for a document in the fact of its being printed or constituting a literary work, or being intended for the public and having been published, or appearing in the form of a volume.

If one were to confine oneself to the generally accepted view today, one would have to say: literary works alone are within the scope of the science of the book. By literary works one means written documents which externally have the physical form of the book or, at least, a form which is derived from it (a gathering of several sheets of paper, vellum, etc.) and, internally, have the structure of an intellectual organism, a statement of closely linked notions and ideas with a beginning, a middle and an end, and a logical construction of phrases, sentences, paragraphs, and chapters. Actual physical objects and monuments, it goes without saying, would therefore be ruled out. But polygraphic reproductions of them would also be set aside as would everything which constitutes a figurative, schematic or symbolic representation of them: that is to say, drawings, engravings, prints, illustrations of all kinds, photographs, musical parts, diagrams, maps and outlines. No longer would manuscripts be included or archives or printed items of news or collections of these (that is, newspapers) or any other kind of writing. But such a limitation applied to the documents which fall within the domain of the science of the book can be countered by numerous and forceful arguments [4].

The limitation is based on the morphology of documents and not on their function. Now, one can observe that in most branches of scholarly work, the function of documents is becoming more and more important. It consists in achieving an ever better distribution of exact, precise and complete *information* on all the topics which are the subject of the study and concern of man, no matter the form in which the information can be supplied. This general point of view, whose acceptance is only relatively recent, takes into account the present situation and future requirements much more than traditional approaches and the historical development of the Science of the Book. It gives to the latter a more rational and stable foundation than the rather arbitrary distinctions that have been used to justify the inclusion of certain categories of documents in the domain of the book or their exclusion from it. Whether literary works are printed or in manuscript, whether it is a matter of complete and systematic accounts or of single, separate facts, whether the written documents have been prepared to meet particular needs or whether they were intended from their inception for the general public, whether they constitute manuscript archival materials or publications distributed in a great number of copies, or whether, finally, they are writings pure and simple or drawn representations or photographs of real objects or schematic representations of intellectual concepts - all of these documents, without distinguishing between them, are able to make some contribution of knowledge to whoever is searching for particular information on a given matter. Henceforth, it will be the documentary character of these different classes of objects which will prevail over others and will justify their inclusion, from this point of view, in the domain of the Science of the Book.

The trend towards the systematic organisation of documentation, towards making it the true object of the knowledge that until now has been indicated by the name *Science of the Book*, is clearly demonstrated by an examination of three orders of fact: the orientation of bibliographical works, the modern requirements of libraries, and the attempts which have been made to improve and change the present form of publications.

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[4] The determination of the domain of the science of the book has practical implications for the documents which bibliographic repertories are to include or exclude.

Of the role of bibliography as an instrument of documentation, there is no need to speak here other than by way of recapitulation. Statements of purpose of all the great bibliographical works which have been undertaken deal repeatedly with the several aspects of this question [5]. Born of the need to have an inventory of literary riches, bibliography has been extended and improved until it has become an indispensable guide across the vast terrain of written documents.

Following the unforeseen development of scientific literature as a result of the journals and bulletins of learned societies, one may assert that nearly everything that has been discovered, observed or thought, has become the basis of an article, or a note, or a printed communication. This enormous mass of apparently unconnected documents nevertheless does have at least one most important link: it is the product of international co-operation for the development of knowledge. If an immense map of the domains of knowledge were set before us, showing all of the complex divisions and sub-divisions of their territories, we would be able to pin-point quite easily any work being undertaken in any of these regions. We would see how this work adds to similar work in order to advance what was written previously, and how in its turn it serves as a link between past achievements and future progress. Such a unitary and synthetic conception of knowledge and documentation underlies the foundation of the Universal Bibliographic Repertory [6]. When this repertory is completed, all that has been written can, in a certain sense, be thought of as forming a single great book, a book of formidable proportions with a more or less unlimited number of chapters, but, in the final analysis, a book that is well organised and easy to consult because of the general index by subjects and authors' names that the repertory provides.

Documents that have been collected and lie today unused in lifeless depositories - because they are unknown to those who have the greatest need of them - will then truly contribute to the general development of ideas. They will be able to nourish intellectual work wherever it is undertaken. At last intellectual workers will possess a precise and comprehensive instrument of learning and information able to respond at any moment to the questions which will be addressed to it in this two-fold form: "what works have been published on such and such a question? What works have been published by such and such an author?"

The completion of this task will not mean that the work of Bibliography will be at an end. It must then, let us proclaim it, attempt to take a new step forward. The ultimate units registered and classified in the bibliographic repertory are books, brochures, and journal articles. Bibliography must not be limited to what are in effect such gross components. If the development of science proceeds from the simple to the complex, scientific research proceeds from the complex to the simple. Just as chemists have moved from analysing molecules to analysing atoms, and biologists from tissues to cells, even so must the bibliographer, having completed the inventory of written works, attempt an inventory of the contents of these works. *Analytical Indexes* must take their place beside *Bibliographical*

[5] See particularly, the *Bulletin of the Institut International de Bibliographie* and the *Répertoire Bibliographique Universel*, Vol. 1, p. 15²

[6] "To gather together, to amalgamate and co-ordinate the bibliography of the works of all places, in all languages, on all subjects in a single repertory consisting of two parts: the first a repertory of subjects, the second a repertory of authors; to set up this repertory in such a manner as to permit its reproduction in multiple copies, to divide it according to the various branches of knowledge and to keep it constantly up to date with current scientific and literary production - such is the work undertaken by the International Institute of Bibliography under the title *Universal Bibliographic Repertory*."

Catalogues. Methods will be found to index works quickly and completely in order to permit the retrieval, instantly and without trouble or difficulty, of the substance of what each publication contributes to knowledge.

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But bibliography, whatever improvements it may one day enjoy, is only a guide, an instrument of research. Ultimately, it is necessary to go to libraries to obtain the actual documents, the sources of our written knowledge. Thus it is no wonder that in recent years, as the requirements for more extensive and easier documentation have become more clearly accepted, libraries have been undergoing profound changes. No wonder, moreover, that new principles have been formulated in programmes of "political library economy," if one can express by this term all of the ideas which have been proposed for future action in this area.

For a long time, libraries were only "warehouses of books" entrusted to "curators" whose principal pre-occupation was to keep close guard on the collections placed in their care. The development and of the collections and the better use of them by the public certainly were not irrelevant concerns, but how secondary in their view were such tasks and how primitive the methods they employed! In order to understand how this happened it is necessary to re-read from this point of view the history of the origin and development of the great libraries.

Today, there exist collections of books comprising more than two million volumes and whose annual accessions are more than one hundred thousand volumes [7]. They have had to come to grips with quite new problems arising, on the one hand, from difficulties of storage, classification and circulation of such tremendous masses of materials situated in the centres of large cities, and on the other hand, from new ideas within the research community about what it should be able to gain from such resources. Once, one read; today one refers to, checks through, skims. *Vita brevis ars longa!* There is too much to read; the times are wrong; the trend is no longer slavishly to follow the author through the maze of a personal plan which he has outlined for himself and which, in vain, he attempts to impose on those who read him.

Works are referred to, that is to say, one turns to them to ask for a reply to very precise, specialized questions. The reply found, one parts company, ungratefully no doubt but certainly for a thousand good reasons, from the obliging friend who has just given such good service. It rarely happens that an adequate reply is found in a single book and that it is not necessary to obtain such a reply from a combination of partial answers provided by a variety of works. Thus arises the necessity of having available great quantities of works, as many as possible; thus, also, the obligation of not systematically eliminating any work from book collections because little importance or value is attributed to it. Who can make a pronouncement on the usefulness or uselessness of a document when so many interpretations of the same text are possible, when so many former truths are recognized as wrong today, when so many accepted facts have been modified by more recent discoveries; when, in the present anarchy of intellectual production, so few questions have been dealt with

[7] See Paul Otlet: "La Statistique internationale des imprimés" in the *Bulletin de l'Institut International de Bibliographie*, 1896, 300-319; 1900, 109-121; 1902, p. 210-212.

exhaustively by a single author; and when, so often, it is necessary to be content with a half-truth or run the risk of remaining in a state of complete ignorance?

The number of works which libraries contain increases the need for documentation, just as organs develop functions. This need, in its turn, acts strongly on the necessary enlargement of collections of books. But this process cannot be confined to the realm of large libraries. It spreads beyond them through the diffusion of the works themselves. More reliable, better arranged, more up-to-date books can be produced because of the improved bibliographical apparatus of these libraries. Such books become models that, naturally, intellectual workers, who otherwise only have access to inferior bibliographical equipment, wish to imitate and surpass. Such books lead us to pose very clearly the problem of documentation in relation to libraries of the second rank.

It is just the impossibility of satisfying everyone by increasing the number of large libraries that has imperceptibly given rise to the notion of a new organisation for collections of books. A general library service is undertaken in each country by the central or national library in cooperation with special and local libraries. From the public's point of view, these will be transformed simply into departments or branches. The central library, according to this programme, is thought of as a "universal library" in terms of periods, countries, and subjects of the books in it. Even with all the restrictions which must be imposed in fact on such a notion, in principle it constitutes the realization of the complete library of which the Universal Bibliographical Repertory is the ideal catalogue. Hitherto unorganised deposits of older materials which it assimilates into its own collections begin its development, and it continues to grow by means of purchases, exchanges and donations.

This concentration, this fusion, as in industry, brings with it tremendous economies of management. It places materials in more beneficial conditions with respect to security, care, maintenance, and protection from fire and other dangers. Moreover, it facilitates enormously the use of materials because the location of the central library is in general more accessible during the day, and because a more numerous and expert personnel is responsible for cataloguing, housing and circulating the materials. The collections also complement each other. They are acquired with more discrimination and the amalgamation of budgets leads to the avoidance of duplicate purchases which are so disconcerting when resources are lacking for the acquisition of essential items.

On the other hand, the increase in budgets permits improved facilities. Buildings, furniture, heating, lighting, and the circulation of books can be dealt with in quite new ways. Mechanization is transforming older systems and is beginning to be used in Documentation to deal as extensively as possible with the material side of its preparation and to free it from physical restrictions that have no interest or value [8].

The central library has become very much better organised. It is divided into sections, each of which corresponds to one of the major branches of knowledge: this is the principle of federation. Documents are classified by subject. A specialist is placed in charge of each section and is located with the works belonging to his subject and under his control. Readers are no longer brought together in a single large room in the chance order of their arrival, but are dispersed in various rooms which house the books belonging to each specialty so that the distance between books and readers is reduced to a minimum. Readers have free access to the shelves and can make use as they wish of all the works there. Thus readers have

[8] Spofford, A.R., 1903: "The mental and mechanical in librarie (*sic*)."*Library Journal*, January 1903.

an opportunity of really getting their hands on the best books on the subjects of interest to them [9].

Following the integration of its own services, the central library gradually absorbs into its organisation previously independent but related services whose importance immediately begins to increase when they become part of a well-organised whole. These services are international exchanges between scholarly bodies, legal deposit, the exchange of duplicates between libraries, the publication of union catalogues for several libraries, the collection and distribution of government documents, bibliographical services, the industrial archives of patent offices, the libraries of learned societies, and collections of documentary photographs, portraits and scenes.

The administration of the central library is divided into sections first according to the nature of service and second according to various subject specialities: philosophy, natural sciences, medical sciences, social sciences, etc. But to strengthen and extend the scope of what it does, the central library also tries to involve in its management and work the scientific institutions and associations that want to be useful. In this way it attempts never to lose contact with what can keep it informed of the true needs of those who must have access to it.

Finally, use of the documents preserved in these great depositories, the dissemination of their treasures, will become a major activity in the future. Already the library has been christened the University of the People. This is intended to indicate that it is truly the place where the public can come at all hours of the day to find knowledge freely available without any preliminary formality and without being restricted by the complications of programmes of classes and lectures: it is the university of self-instruction. Bibliographical catalogues situated at the entrance of the reading room provide initial guidance. Beside them, Section Heads are living informants, eager to introduce those unfailingly obliging but modest and reserved "teachers" who speak only when spoken to, which is what books and documents are. These are not the only kinds of information to be offered to the public. As well as the catalogues and the section heads there are information services on every general subject. Having themselves been coordinated and considerably improved, these services too have become associated with the central library. They are the scientific and technical information services which government departments and private institutions set up many years ago to inform and guide the practical activities of citizens in the fields of industry, commerce, agriculture, and social service. Such services (commercial museums, social museums, colonial offices) have arisen because of the difficulty experienced by most people in finding their way around publications when they need to get information rapidly and comprehensively. It is noteworthy that these services are being associated with the central library, for they are also, in some fashion, sources of documentation.

Organised as just described, the central library truly constitutes a central Institute of Documentation. It becomes, with respect to received knowledge that it must preserve and disseminate, a kind of special *universitas*, just as knowledge that is new and to be taught has

[9] "All scholars wish to encounter in a library neither physical impediments nor administrative intermediaries; one dreams of being able oneself to search in easily accessible shelves for a wanted book, to go through a series of periodicals, to scan a card catalogue, to consult "a source" for a bibliographic reference, and to do all this just at the exact moment one's curiosity is aroused before it is blunted by an often vain wait or irritated by the traditional "the book is at the bindery". (A note by M. Maxweiler about the Library of the Institut de Sociologie Solvay, *Revue des bibliothèques et des archives de Belgique*, 1903, p. 235.)

been gradually concentrated in the great modern *universities*.³ Moreover, as the latter have ramified throughout the country in special institutes, institutions of secondary education and university extension and in various other decentralised ways, so the central library ministers to the whole of a nation. First of all it establishes relations with all of the libraries in its own location, the capital city, and then with the various provincial libraries. Modern methods of transportation are used in dealing with requests for and the distribution of books: post, telephone, cartage, railway and underground communication by means of pneumatic tube or monorail. Provision is made for the circulation of documents between the principal centre and all of the secondary centres no matter how far away they are. The functions of the latter are being transformed; they are becoming simply places for reading and consultation; though physically distant from the centre, they are organisationally a part of the central library.

Such are, schematized, summarized and inter-related, the organisational trends characteristic of our most modern libraries, to the great bodies of which we must give a brain and a soul. These trends, as we have seen, are all the result of the increasingly apparent need for organising documentation itself.

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The attempts which have been made to improve and change present methods of publication, in their turn suggest another aspect of the same need. The study of documents as such results in two kinds of knowledge, depending on whether documents are considered from a physical or an intellectual point of view. The physical construction of the document, its substance, its external form, and in so far as the book is concerned, its manufacture, sale, use and preservation, have led to the creation of special branches of knowledge. But the writing, composition, planning, editing, the internal structure of a document, a book, an article, etc., the mode of publishing any statement of ideas or information, can become the basis of a separate body of observations and considerations, some of which are applicable to all documents while others are special to certain categories of them.

No matter the form they take, not all explanations or statements are equally clear or easy to understand. This preliminary remark provides a basis for observations that can be made when a great many pieces of writing are compared from the point of view of how they present facts and ideas.

Since antiquity, rhetoricians, critics, and literary theorists have carefully distinguished genres of literary works. No matter what the author's subject is or the language he uses, they have tried to arrange these works into groups and sub-groups according to rules they have derived from the best examples: works poetical, dramatic, oratorical, epistolary, didactic, narrative, historical, etc. This analysis has been restricted to literature properly speaking. It is really only now that the immense mass of scientific and technical writing has become the object of systematic classification by genre and form. These works are of relatively recent origin. Their general types are only gradually, and as yet incompletely, being distinguished from primitive "amorphism" and "polygraphism." Everyone, however, can recognize, if not define, such categories of published works as the journal, the annual, the handbook, the general treatise, the encyclopedia, the glossary, the textbook. In all branches of learning, written materials have today spontaneously taken one or other of these expository forms each of which is a response to a special documentary need. It seems possible and useful, therefore, to deduce from the study of a great many works the conditions which each

work of the same genre should satisfy if it is to approximate to an ideal type and meet some reasonable statement of requirements. Indeed, no one will argue that, if one handbook seems to be more practical and easier to consult and handle, to be clearer and more complete than another, this is because it is adapted better to clearly stated needs.

What are these needs and by what means can they be satisfied?

The theory and technique of bibliographical or documentary forms, their anatomy, morphology, phylogeny, if one can use these figurative expressions which indicate fundamental approaches that can be taken to the study of anything, have yet almost entirely to be developed but constitute a kind of knowledge which is directly related to documentation considered in general.

If these problems were made the object of sustained research and of fairly extensive comparisons, it is clear that eventually the types of publication would begin to improve markedly. This study would make selection, the result of the *struggle for life [sic]* among the intellectual organisms which is what books are, more conscious and better-informed. New forms would also begin to be produced to be added to the range of those that already exist and to respond more effectively to modern documentary requirements.

Finally, having improved and increased in number, these forms of works will imperceptibly lead to a complete transformation of modern publishing. This is not the least important conclusions to which the examination of these questions leads.

Books, brochures, and journal articles appear nowadays apparently as the products of chance. Everyone has freedom to publish on any subject, in any manner, in any form, in any style, consequently, to clutter up the field of documentation with vague and useless productions which have nothing seriously new to say as to substance and which represent no improvement as to form. Should we not impose a doctrine of "moral restraint" in the sphere of the book where an overwhelming and truly harmful proliferation is rampant? In fact, no one would dream of suppressing or even limiting this precious freedom of writing, a necessary corollary of freedom of thought, which is, itself, nothing more than the fundamental right of intellectual life, action and procreation. But the task of organising this freedom by means of appropriate institutions, just as political institutions and codes of law have organised other freedoms, falls to those who are aware of the problem.

Individual publications will continue to appear quite independently of each other. They will retain their characteristics of being separate, idiosyncratic and poorly related to the whole body of knowledge itself. But paralleling the innumerable books published on the subject-matter of each discipline, will be drawn up the "Universal Book" of that discipline. This Book, the "Biblion", the Source, the permanent Encyclopedia, the Summa, will replace chaos with a cosmos. It will constitute a systematic, complete and current registration of all the facts relating to a particular branch of knowledge. It will be formed by linking together materials and elements scattered in all relevant publications. It will comprise inventories of facts, catalogues of ideas and the nomenclature of systems and of theories. It will condense various scientific data into tables, diagrams, maps, schemas. It will illustrate them by drawings, engravings, facsimiles, and documentary photographs. It will be like a great cadastral survey of learning, in which all developments in knowledge will be reported and recorded day by day. This function will devolve on specialists, or keepers, whose duty will no longer be to preserve documents, but the actual knowledge they contain. Readers, abstracters, systematisers, abbreviators, summarizers and ultimately synthesizers, they will be persons whose function is not original research or the development of new knowledge or

even teaching existing systematic knowledge. Rather their function will be to preserve what has been discovered, to gather in our intellectual harvests, to classify the elements of knowledge.

The old forms of the book will no longer be maintained; they must give way before the abundance and the variety of matter.

Information, from which has been removed all dross and all foreign elements, will be set out in a quite analytical way. It will be recorded on separate leaves or cards rather than being confined in volumes that are compact and in many copies. They are mixtures of what is repetitive, preliminary and for reference and contain all those superfluities in which, nowadays, an original thesis, a new proposition, a novel observation, an important result, are submerged and disappear. By gathering these leaves together, and classifying and organising them according to the headings of a reliable, precise, and detailed classification, we will create the "Universal Book" of knowledge, a book which will never be completed but which will grow unceasingly. Appropriate furniture, on the model of what is now being used to organise, classify and house the cards of the Universal Bibliographic Repertory, will be necessary for housing it.

The analogy of this repertory will also extend to methods of publication and consultation. Printing these information-cards will no longer be considered an indispensable necessity. Offices of documentation, whose collections will be formed by cutting and pasting and by manuscript transcription, will be set up as annexes or complementary organisations to libraries.

These offices will be the distributors of all scholarly information. Organisations for the preservation and diffusion of knowledge, they will disseminate it by the written means of the document just as schools and teachers transmit it by oral means. When someone wants to have without delay reliable, exact, and completely up-to-date information that is analytically presented so that it is ready for immediate use either in some personal interpretive study in which he is engaged or to advance research which he is planning, he will apply to these offices. But these offices themselves will gradually begin to publish the "Universal Book" with whose creation and preservation they have been entrusted. This publication will itself take a loose-leaf form or be on cards, the more recent of which, always continuing the summarizing and condensing process, will replace earlier leaves or cards. Finally, a day will come, the ultimate step, when it will generally be recognized, if not by all at least by most, that every publication should be subject to precise rules for editing, composition, printing and distribution. The form of "The Universal Book" will then determine the form in which all scholarly publications will be issued. The work of documentary offices will be considerably simplified at this point. The "Universal Book" will create itself from day to day as the leaves of individual publications are gathered together. As many whole or partial, complete or abridged duplicate copies will be available as existing documentary institutes and particular individuals might want.

So that such a view as this will not lay itself open to the charge of being a theoretical dream when it is only an extension of present developments, let us briefly recall here some of the phenomena that suggest what will happen in the future: works written at the request of publishers aware of the needs of particular categories of readers; works prepared in response to competition questions or in response to the desiderata formulated by scientific societies or conferences; basic works whose authors have died but which are continued by other authors following the same methods; supplements, complements, addenda and

corrigenda to important works published by various persons; the periodical revision by authors themselves of the general works which they have published on their special subjects; the creation of increasingly specialized, comprehensive and frequently issued journals for keeping up with a particular movement of ideas and for reproducing the principal documents related to it; abstracts of the publications which appear daily on a subject; the assumption of responsibility for basic publications (formularies, encyclopedias, handbooks, collected works) by official or scientific institutions when there is reason to believe that private enterprise will only produce incomplete, irregular or partial documentation, etc., etc. These are some of the trends characterising the development of the systematic spirit which must govern new publications.

On the other hand, bibliographical indexes, abstracts, reviews, extracts and summaries, the number of which has been increasing in an extraordinary way, publications issued in the form of fascicles or on cards, the complex numbering systems of materials published in the great collections, the multiplicity of tables and indexes which characterise certain works - all of these demonstrate the existence of the need to condense what has been written and to retrieve scientific information in an analytic form from which any personal interpretation has been removed.

Finally, the organisation of documentary offices has been anticipated by the organisation of those permanent offices or bureaux whose duty these days is to collect and register facts and make them available to the public: institutes of bibliography with their catalogues; social and commercial museums with their files of documents and information; various services of large government departments such as, typically, labour offices, which are required to monitor, note and maintain a record of certain facts about governmental or social activity; geological services which must draw up and keep current manuscript geological maps; observatories which publish tables of observations, maps of the sky, catalogues of stars; cartographic and geodesic commissions whose files are placed at the disposal of scholars in order to improve periodically published maps; patent offices whose industrial archives form a permanent registry of inventions and discoveries; statistical offices whose year-book and tables of numerical data can at any time be augmented by the actual cards which were used for the various kinds of census, etc., etc. [10]

In summary, the book as shaped by the past is in the process of complete change. The experiments that we are now witnessing are to make the book easier to consult and easier to handle so that it is more effectively and more quickly informative - in a word, more documentary. These experiments are all leading to a better organisation of documentation.

In the preceding pages we have investigated how to define bibliography, its major areas, its essential object. Our analysis, a little abstract perhaps - but how can one approach a general subject without using fundamental ideas? - leads to the following conclusions:

The term, *The Science of Bibliography*, given the limitations of our language, seems to be the most suitable term to describe the body of knowledge and the present state of

[10] Consult particularly: Otlet, Paul, 1901. "La Technique et l'avenir du périodique". Brussels, *Bulletin de l'Institut International de Bibliographie*, VI, p. 179-184; Otlet, Paul, 1901, "Comment classer les pièces et documents des sociétés industrielles", Brussels, *Bulletin de l'Institut International de Bibliographie*, 1901, p. 85-124; Didier, Charles, 1898, "La Revue à découper. Note sur un mode plus rationnel de publier les articles de revues", Bruxelles, *Bulletin de l'Institut International de Bibliographie*, III, p. 175-182; Institut International de Bibliographie, 1902, "Notice sur l'organisation de la publicité des brevets d'invention (bibliographie des brevets)", Brussels, *Bulletin de l'Institut International de Bibliographie*, VII, p. 175-176.

research on the subjects that we have examined. The Science of Bibliography can be defined as that science whose object of study is all the questions common to different kinds of documents: production, physical manufacture, distribution, inventory, statistics, preservation, and use of bibliographic documents; that is to say, everything which deals with editing, printing, publishing, book selling, bibliography, and library economy. The scope of this science extends to all written or illustrated documents which are similar in nature to books: printed or manuscript literary works, books, brochures, journal articles, news reports, published or manuscript archives, maps, plans, charts, schemas, ideograms, diagrams, original or reproductions of drawings, and photographs of real objects.

The practical aim of the Science of Bibliography is the organisation of documentation on an increasingly comprehensive basis in an increasingly practical way in order to achieve for the intellectual worker the ideal of a "machine for exploring time and space."

Editor's Notes

1. "Les Sciences bibliographiques et la documentation", *IIB Bulletin* 8 (1903): 125-147.
2. It is not clear what this reference is to. Presumably, Otlet is referring to "Creation of a Universal Bibliographic Repertory" (see paper 2 in this volume). Page 15, however, presents part of the outline of the Dewey Decimal Classification. Pages 8-11 however, list some of the great bibliographical ventures of the past from Marucelli to the Catalogues of the Bibliothèque Nationale and the British Museum.
3. The medieval "universitas" meaning "totality", "all in one" (perhaps with a hint of "solidarity") was a guild for scholars who had come together in "studia generalia" or "centres of general learning", chartered as they matured and attained influence by the Pope. They were devoted to the preservation through repetition and copying of established texts, knowledge of which was tested in commentaries and debate. McArthur, whose definition I give above, notes that "in due course, by a kind of social osmosis the name for the scholarly brotherhood was transferred to the institution in and for which they worked" (Tom McArthur *Worlds of Reference*, p.59). It was not until the nineteenth century that universities began to be regarded as more than centres of traditional learning but as places in which a pervasive commitment to research informed and created a characteristic tension with their teaching function.

6. ON A NEW FORM OF THE BOOK: THE MICROPHOTOGRAPHIC BOOK.¹

All contemporary developments in the external form and substance of the book, the way it is written and set in type and the way its subject is organised, have an important place in bibliographic studies.

These studies should not be limited to an examination of the past alone. Like other branches of knowledge, the Science of the Book should lead to practical applications. In addition to history and theory, it should be concerned with the ways in which its object (volume, journal or newspaper; text or image) can continually be improved.

As far as its external form is concerned, the Book - which successively has been cut in stone, baked on brick, painted on papyrus, hand-written on parchment, engraved on wood and reproduced by printing and lithography on paper - nowadays is tending to assume a photographic form [1]. Until now this development has been limited to the illustrated matter of the book. Such a "pictorial" limitation is not justified. This development can be extended to the text itself.

What has been achieved in this area? What can realistically be expected in the future? This is what this preliminary communication is about.

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All progress, all reform is the result of a need of which we become aware and for which a clear expression emerges as a result of the criticisms that can be made of anything ongoing. As far as the book is concerned, despite admirable technological progress since the fifteenth century, all is far from perfect.

The book is still heavy to handle and takes up a relatively large amount of space. On average, one square metre of shelf space 35 centimetres deep is needed to hold 100 volumes, without taking into account aisles between stacks and the area required for such various installations as lifts, conveyors, etc. which are required for the use of books in a library [2]. Books come in very different sizes - from 5 centimetres to a metre in height and in all widths [3]. Books are expensive because of the technical requirements

[1] Paul Otlet, *Les Aspects du livre*, Brussels, publication of the Musée du Livre, 1901 (The last paragraphs are devoted to a theoretical and analytical statement on future forms of the Book).

[2] Graesel, *Bibliothekslehre*, p. 123 gives the surface area and volume occupied by the books in several large libraries.

[3] On the format of books and journals and the need to standardize them, see especially discussions of the Congrès de la presse périodique belge, Ostende, 1906, given in the *Bulletin* [of the Institut International de Bibliographie], 1906, p. 89.

for their manufacture. In thirty years the average price of scholarly works has increased by 33 percent [4].

Books cannot be voluntarily reproduced as needed except by the always burdensome process of issuing re-prints or new editions. Several hundreds or thousands of copies must be produced at any one time without knowing how many will be sold. Hence arise attempts by publishers to rid themselves of unsold stock. This is disposed of to anonymous second-hand dealers or is simply destroyed. Thus, copies of a book rapidly become scarce and, a few years after publication, are no longer available.

The end result of this sequence of events can be confirmed by a statistical analysis recently completed in Berlin. The Königliche Bibliothek in Berlin and eleven Prussian university libraries, having agreed to form a union catalogue (*Gesamtkatalog*)², were disappointed in their hope of great economy of work, for it was found that 60 percent of the titles were held by only one of the twelve libraries [5].

In short, the present situation of the Book and the Periodical from the point of view of scholarly research is this: titles are distributed to many libraries which are situated in cities far distant from one another; access to these libraries is not always easy and delays in securing works often discourage the most tenacious workers with great injury to scientific progress.

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The documentary method complements the other methods of study and research - observation, experimentation, and deduction. All the related research work that is completed in various countries by various persons, whether predecessors or contemporaries, is recorded in books and journals. If one is to use this work, if it is not to be repeated, if one is to take advantage of the cooperation of others and immerse oneself in all the information that it is desirable to have, it is necessary to be familiar with the bibliography, with the literature - past and present, national and international - of a subject. But it is not enough that a general organisation of bibliography is leading each day to the development of a *Universal Bibliographic Repertory*, which is an instrument for concentrating and a point for distributing bibliographic information. It is still necessary that the writings referred to, the original sources themselves, and not merely abstracts or summaries of them, be put into the hands of researchers.

The journeys of scholars, international exchanges of scholarly books between libraries [6], copies or extracts requested from abroad and the purchase from agencies of clippings from periodicals [7], are quite inadequate for this purpose. The concentration of collections of books in every city into a single great library is a trend which is increasing. The creation of special international libraries, even an international library that is

[4] Die Finanzlage der deutschen Bibliotheken. In *Sammlung bibliothekswissenschaftlichen Arbeiten*. 16th fasc., Leipzig, Spiegatis, in 8°, 30s.

[5] On this subject see *Zentralblatt für Bibliothekswesen*, 1906, *passim* for discussions about the *Gesamtkatalog*.²

[6] On international exchanges between libraries see especially Graesel, *Bibliothekslehre*, p. 349 as well as a note in the *Bulletin* [of the Institut International de Bibliographie], 1906, p. 112.

[7] See *Bulletin*, 1906, p. 221.

universal in scope, has been advocated [8]. However, it is a new method of publication that would contribute most rapidly and extensively to the improvement of the present situation [9].

From the preceding examination the requirement can be deduced that a new form of the Book should be found which will do away with the inconveniences referred to and which in the future will produce books that are: 1) less heavy and smaller; 2) uniform in size; 3) on a permanent material; 4) moderate in price; 5) easy to preserve; 6) easy to consult; and 7) continuously produced: that is, copies or duplicates can be produced on request.

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Photography would seem to be able to provide a solution to the problem thus posed. It is this to which we must now have recourse for new developments in documentary methods.

Research along these lines has been undertaken at the International Institute of Bibliography. The goal has been to create in a practical way a *microphtographic book* which can be enlarged as needed at the time of reading. The experiments made so far suggest that it will be possible to reproduce in very small dimensions any page of a book or any kind of printed image on one of the successive and very small sensitized frames which make up a microphtographic reel. These frames would then be brought before an enlarging apparatus at the time of reading.

This is the overall idea. It is not entirely new. As early as 1865, Simpson suggested it in extremely precise terms. Indeed, one can read on page 158 of a work published in 1880 by H. Vogel (*The Photography and Chemistry of Light*): "In England, Simpson observed that by means of photography it is possible in an area of a few square decimetres to concentrate the contents of huge folio volumes and that books occupying whole rooms can be fitted into the equivalent of a single drawer by means of reduction by microscopic photography. This is an important consideration because of the rapid, ceaseless growth of materials accumulating in our libraries. It is true that it would be necessary to use a microscope or magic lantern to read these miniature books."³

During the siege of Paris in 1870, the procedure suggested by Simpson was used to send dispatches by carrier pigeons from the country into the city. Dagron carried out the photography involved. A film 4 x 4 centimetres held up to 1500 dispatches. A film 3 x 1 centimetres contained 16 printed pages. The films were subsequently enlarged by means of a magic lantern.⁴ Since that time, Scamoni of St. Petersburg has obtained 2.5 square centimetre proofs that are quite legible under a microscope of the German newspaper *Ueber Land und Meer*. The governments of various countries have set up

[8] Paul Otlet. *L'Etat actuel de l'organisation bibliographique internationale*; chap. iv (Les idées actuelles sur le Livre, sa fonction et son utilisation p.28 [Contemporary ideas on the function and use of the book] and L'Organisation rationnelle de l'information et de la documentation en matière économique. [The Rational Organisation of Information and Documentation in Economic Matters].

[9] Rigby Smith (L'accèsibilité d'informations) in this felicitous expression summarizes present needs: "it is imperative that society have intelligent coordination of intellectual work." The goal underlying the development of the Universal Bibliographic Repertory is precisely to have in the future a research instrument for books such that all past, present and future writings can be considered as the chapters and sections of a single great book which sets forth the whole of human knowledge and for which the Repertory is the table of contents.

war-time work-rooms for microphotographic correspondence in their military pigeon-stations.⁵

With such precedents, it is now a question of having these methods accepted in current practice and of devising commercial procedures for creating and reading *microphotographic books*. Here are some brief facts about the direction and the results of the experiments we have undertaken. It is necessary to distinguish two stages in time: the creation of the microphotographic document and its use, that is to say, reading it.

1. We have tried to create documents in the form of tough, stable, non-flammable film in the format of the international catalogue card (12.5 x 7.5 centimetres) [microfiche]. This has a usable surface, narrow margins assumed, of 72 square centimetres. Reducing the pages of a book by a 50th, 100th or 200th according to format and type, one may assume for the purposes of investigation and discussion that, after reduction, a page of text covers one square centimetre, or a whole fiche will hold seventy-two *microscopic* pages plus the title of the book in ordinary "microscopic" type in the form of entries for the Universal Bibliographic Repertory [10]. The reproduction should be made from top to bottom and then from left to right. We would then have the following pattern, in which the numbers in each centimetre square would be the successive pages of a book;

Durand, Louis

536.771

1906 - Sur l'expression des grandeurs thermiques. *Compte rendu Académie des Sciences*, 1906, p. 420-492.

1	7	13	19	25	31	37	43	49	55	61	67
2	8	14	20	26	32	38	44	50	56	62	68
3	9	15	21	27	33	39	45	51	57	63	69
4	10	16	22	28	34	40	46	52	58	64	70
5	11	17	23	29	35	41	47	53	59	65	71
6	12	18	24	30	36	42	48	54	60	66	72

[10] The Charpentier page format, which is used for most novels, is 18.5 x 12 centimetres or 222 cm². The area of the printed text in this format is about 13 x 8 centimetres = 104 cm². A very frequently used page format for scientific periodicals is an octavo 25 x 16.5 centimetres = 412 cm² with the text occupying 18 x 10.5 cm or 189 cm². From the point of view of readability after reduction it is necessary to take into account the size of the typeface and the degree of clarity of its design. On this last point see the very important studies of the eminent oculist Dr. Javal: *Psychologie [sic for Physiologie] de l'écriture et de la lecture*, Paris, Alcan.

Care should be taken in reproducing the printed pages that enough of their white margins are preserved to maintain a pleasant appearance and to ensure that they are clearly separated from each other.

Clarity of image being a prerequisite of readability, slow, fine grain film and wet processing should be used. Exposure time can be extended. Thus it is possible to return to older processing techniques that the requirements of portraits, landscapes, and moving scenes have led us gradually to abandon. These silver-based techniques have the advantage of being extremely economical. The price of silver has decreased by nearly a half in the last few years and several methods of partial recovery of the quantities used have been explored.

As observed earlier, the negatives for the document must be created in the form of a film. As a result of technological progress, the problems involved no longer need to be regarded in the same way as they were in 1865 and 1870 and solutions can now be foreseen to the difficulties which held back our predecessors. The way to go is suggested by the manufacture of transparent positive film for the moving pictures involved in cinematography i.e. projection. But steps must be taken to protect the negatives against deterioration and fire. These are matters which industrial chemists should be able to solve.

2. The second moment in time which must be considered is the use of the microphtographic document, that is, its enlargement for reading. To be practical, enlargement should be instantaneous and should be accomplished by devices of the smallest possible size the use of which will not fatigue the viewer.

Different kinds of apparatus can be envisaged apart from the simple magnifying glass or the microscope. Much progress has been made in enlarging devices since Simpson spoke of "magic lanterns." Lighted projection is in current use nowadays. Not only are ordinary scenes projected in laboratories and lecture halls, but also microscopic slides.

If the film-negative described above is placed in a very simple enlarging machine which contains magnifying glasses and is lit by an electric light, the image, enlarged at will to various sizes, can be projected on the frosted glass which closes the opposite side of the *camera obscura*.⁶ That is where "seeing" the text, reading it, will take place. A contrivance adapted from the carriage of the microscope or typewriter will move the fiche from left to right and from top to bottom merely by pressing a button. Thus the reader is free to bring one after another in front of the lens the pages microphtographed on each centimetre of film.

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Laboratory experiments suggest that the technical problems we have just described can be considered as completely solvable. If, as it is hoped, industrial applications of the processes are possible, the practical consequences will be of the greatest importance. First, the preservation of microphtographic documents will become easy. They will be arranged in banks of drawers similar to those now used for card catalogues. Because of the light weight and small size of the documents, it will be very

simple to set up collections rigorously classified by subject or according to some other order.

Moreover, each filmed document can be used as a negative in its turn for making new copies. It is of little consequence whether a printed text is read black on white or white on black; that the latter is preferred for advertisements and publicity suggests that it is actually more legible.

In addition, the microphotographic process will be very economical. Labour is almost the only factor to be taken into account in creating the film; raw materials are insignificant in price [11].

Initially, the procedure described would be used to reproduce collections of illustrated matter or periodical articles, even indeed separately the conclusions of theses. They could be reproduced at the same time as the bibliographic cards themselves. This is a goal particularly aimed at by the Institute of Bibliography. It would meet the requirements of those who consult its repertories and who crave some rapid means of distinguishing the useful from the useless in the cards supplied without having to waste precious time in numerous libraries. Collections of periodicals in our public depositories are generally very limited and incomplete, while journals are not systematically collected by individuals.

Since each fiche contains an area on which at least seventy-two pages of text can be reproduced, only one card would be needed for most articles because they rarely exceed this length. In principle, it would be best if a distinct and separate card were used for the photographic negative of each article.

If photomicroscopic printing and reading processes come into use on a large scale, undeniably extensive consequences may be anticipated from them. A more rapid distribution of printed matter of a scholarly kind would occur as a result of their extreme cheapness and the ease with which each centre, library, or institute which contained the documents, could have them reproduced either from actual copies or from photomicroscopic negatives. The situation of libraries in these new circumstances would be similar to that of museums of documentary photographs [12]. Old manuscripts, original documents, rare or out-of-print works would be reproduced first and fires in our depositories would thus be less dreaded. All kinds of prints, pictures, and documentary photographs which have been assembled in local or special collections, could be duplicated and exchanged by means of this new mode of "publishing." It would be

[11] It is to be hoped that the price of a master containing 84 pages of text will not exceed 25 centimes, or, with everything included, one franc for a volume of 336 pages which today costs libraries at least 5 francs (the price of the book, 3.50; binding 0.50; shelf space 0.20; building 0.75 at least). The building and materials of the Library of Congress alone, not including its collections, cost 36 million francs. The allocation for shelves in the new Königliche Bibliothek in Berlin, calculated on the basis of 5 million volumes, has amounted to a million francs or 20 centimes a volume. This latter library will be 150 x 90 metres in size. The stacks will have 9 floors 2 metres high. It can be approximately calculated that to house and classify one million volumes the following are necessary: 10,000 square metres of shelf space, 35 centimetres deep; 3,300 cubic metres of shelves; 6,200 square metres of floor space, 2.25 metres high; and a building of 13,700 cubic metres. In comparison with this last figure, the space needed for the cabinets containing one million microphotographic volumes with a reduction factor of 100, would be about 75 cubic metres or 444 times less.

[12] On the importance and future of these museums see the work of the Congrès international de la documentation photographique in Marseilles, October 1906.⁷

possible at last to anticipate setting up international and universal libraries and picture collections.

If one had the necessary resources at one's disposal all of Human Thought could be held in a few hundred catalogue drawers, ready for diffusion and to respond to any request.

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It is quite natural that such developments should seem like marvels and that initially, deeming them to be impossible, the mind should reject any pursuit of them. But, according to a common slogan, do we not live in a time in which yesterday's utopia is today's dream and tomorrow's reality? In order to create the most serious expectations let us simply recall the following result of combining microphtography and enlargement by projection which has already been achieved and widely used: a roll of motion picture film 50 metres long can now be stored in a small metal box 15 centimetres in diameter and 2.5 centimetres deep. The roll contains 5,000 exposures. Each of these exposures can be projected on a screen which can be as large as 16 square metres. This small box, therefore, contains in the form of a minuscule volume the wherewithal to project at will and repeatedly 80,000 square metres of photographic documents.

Note. This communication was read at the Congrès international de documentation photographique at Marseilles (19 October 1906). After discussion, the following resolution was adopted: "The Congress takes note of the communication of the International Institute of Bibliography on the subject of the kind of research that it is undertaking with the collaboration of M. Robert Goldschmidt in order to find a practical procedure for creating and reading documents (both text and illustration) according to the methods of microphtography and cinematography. Observing the importance inherent in the procedures proposed, the Congress invites specialists to cooperate with the International Institute of Bibliography in finding a solution to the requirements that have been formulated."

Editor's Notes

1. Robert Goldschmidt and Paul Otlet, *Sur une forme nouvelle du livre: Le Livre microphtographique*. Publication No. 81; Bruxelles: Institut International de Bibliographie, 1906. This was also published in *IIB Bulletin* 12(1907):61-69, in the January 1907 issue of the *Journal des brevets* and in part in *Photorevue*, 6 January 1907.

Robert B. Goldschmidt, 1877-1935, had a remarkable career. Educated in Brussels and Berlin, and professor of chemistry at the University of Brussels for some thirty years, he worked only for a time in the field of chemistry. He then turned to Aviation and in 1909 constructed a dirigible balloon, La Belgique. He became interested in radio telegraphy and worked extensively in the Belgian Congo setting up a telegraph and telephone network; he also invented an amphibious train and a wood burning truck for use there. In 1908 he opened a Popular Laboratory of Electricity in Brussels, a kind of public museum. He continued to be interested in microphtography throughout his life working on reading machines and film processes.

2. The Prussian Union Catalogue (*Gesamtkatalog*) was a fascinating, and very Prussian, undertaking. Cataloguing rules were drawn up for use by the Prussian State Library and the ten University libraries - not 11 (Berlin, Bonn, Breslau, Göttingen, Greiswald, Halle, Keil, Königsberg, Marburg and, Münster) and were printed in 1899. Each of the libraries then revised its catalogue to conform to these rules. This was completed in 1902. In 1903 the Prussian State Library then began to circulate cards in alphabetical order for items in its catalogue in batches of about 100 to 150 entries to the University of Breslau. On these cards were noted the items Breslau also had and additional cards were added for the items which it held but the State Library did not. The cards were then sent to the next library. It was found that 60 percent of the books whose main entries were circulated were held in only one library. This part of the catalogue was for materials published up to 1897. More current materials were dealt with separately (see Editor's Footnote 5 to the following paper in this volume, "The Reform of National Bibliographies . . ."). A good account in English of the *Gesamtkatalog* is provided by J.H.P. Pafford, *Library Cooperation in Europe*; a more contemporary account in English is Ernest Crouse, "Cooperation Among German Libraries by Mutual Loans and the Information Bureau", 1914.
3. "The magic or optical lantern is an instrument for projecting on a white wall or screen largely magnified representations of transparent pictures painted or photographed on glass...when suitably constructed it can be used in the form of a microscope...Another application...is found in the cinematograph...." (*Encyclopaedia Britannica* 11th ed. Vol. XVI, p. 186.)
4. During the siege of Paris in the Franco-Prussian War, carrier pigeons were taken from Paris in balloons, and microphotographic messages (both private messages for families in Paris and official dispatches) were attached to their legs. Out of 363 birds released only 40 returned to Paris in a five month period, but because the messages were reproduced many times, some 60,000 of 95,000 dispatches entrusted to the pigeon post were received in Paris. Dagron, a famous photographer, was given a contract promising him 25,000 francs for his photographic work in connection with the pigeon post, and with his assistants was carried out of Paris toward Tours by balloon. (The early attempts at filming, the reading of messages by magnification on a wall, and other details are given in Baldick's popular *The Siege of Paris*).
5. Carrier or homing pigeons have been used for centuries to carry messages. The use of pigeons for purposes of military communication, however, became widespread after the Siege of Paris. Many governments set up special services, including Great Britain. The Admiralty discontinued its pigeon service about 1910. With the advent of wireless telegraphy, pigeons were thought suitable only for fortress warfare. Homing pigeons were used in the Korean War.
6. "Chambre noire" or *camera obscura* is "an optical apparatus consisting of a darkened chamber (for which its name is the Latin rendering) at the top of which is placed a box or lantern containing a covered lens and a sloping mirror, or a prism combining the lens and the mirror. ...We can produce on a horizontal sheet of paper an unperverted image...i.e., the image has the same appearance as the object and is not perverted as when the reflection of a printed page is viewed in a mirror."

Encyclopédia Britannica; 11 ed.; vol. V, p. 104). The use of magnifying glasses presumably distinguishes the apparatus Otlet is describing.

7. The resolutions of the conference Otlet mentions in his footnote, one of which he gives as a note at the end of this paper, are given in full in *L'Organisation systématique de la documentation et le développement de L'Institut International de Bibliographie*, IIB Publication No. 82; Bruxelles: IIB, 1907. pp. 62-64. They show the importance of collections of documentary photographs, express interest in Goldschmidt's work for microfilming documents and providing an apparatus for reading them, desire that work be carried out in a uniform way so as to make a Universal Iconographic Repertory possible, define three standard sizes for cards and sheets on which photographic proofs should be mounted, recommend the use of The Decimal Classification, and that a bibliography of photography, a guide to major photographic collections, and a *Manual* for documentary work in photography be created.

7. THE REFORM OF NATIONAL BIBLIOGRAPHIES AND THEIR USE IN UNIVERSAL BIBLIOGRAPHY¹

In his letter of 28 November last to the national associations of publishers, M. Morel², the acting director of the International Bureau of Publishers in Berne, among other things recalled the following advisory resolutions taken in the various sessions of the International Congress of Publishers:³

Systematic classification in publishers' catalogues

7. The Congress resolves as follows: that systematically classified catalogues be more widely used in the book trade;
8. Among the methods of classification, the Congress particularly recommends the study of that based on the decimal system.
9. Publishing houses in all countries should work for the formation of a national bibliography which could be used some day as the basis for the compilation of a Universal Bibliographic Repertory.
34. The Congress, considering the stake publishers in all countries have in issuing catalogues that are thoroughly classified and easy to consult, resolves that a standard, systematic classification for publishers' catalogues should be adopted. It approves and recommends the following arrangement: 1) an alphabetic index by author's names; 2) a classified index by subject; 3) an alphabetic index of subjects by catch words with reference to the author's name and to the brief title.

In support of these resolutions, we have the honour of submitting to the 5th International Congress of Publishers, a collection of the last ten years of the *Bibliographie de Belgique* as well as the first issues of the edition on cards for the year 1906.

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The *Bibliographie de Belgique* is published by M. Ernest Vandeveld under the auspices of the Ministère de l'Intérieur et de l'Instruction Publique and the Cercle belge de la Librairie in collaboration with the International Institute of Bibliography. It appears monthly in issues that contain a first part devoted to books, a second part to newspapers and periodicals, and a third part to a listing of articles contained in the periodicals.⁴

In the first part, books (about 3,000 a year on average) are listed according to the names of authors, but each entry contains the decimal index number for its subject as it appears in the Universal Bibliographic Classification based on the decimal system. A systematic index at the end of the year lists the works in classified order.

The second part contains, listed alphabetically by periodical title with a single entry per year, the periodical publications which appear in Belgium (about 1,300). This part is completed at the end of the year by an annual classified index.

In the third part, the actual articles in the periodicals are indexed and are classified systematically according to the Decimal Classification. At the end of the year, an author index and an index of subject headings completes this part.

Independently of the ordinary edition in volumes which has been appearing since 1875, an edition of the book section of the *Bibliographie de Belgique* has appeared monthly since the beginning of 1906 on cards in the international format, 75 x 125 mm. It has become, therefore, the first national bibliography whose method of publication follows that of the great bibliographical publications undertaken by the International Institute of Bibliography, by the *Library of Congress* in Washington, by the *Concilium Bibliographicum* of Zurich and that announced for the Union Catalogue of German Libraries (*Gesamtkatalog*).⁵

Each card contains the bibliographic entry for a single work (author's name, forename, title, sub-title, place of publication, name of publisher, format, number of pages, price, and, as necessary, notes for clarification.) The author's name is printed as a heading at the left. Immediately, underneath, the date. Facing it, to the right, is printed the bibliographic index or number of the decimal bibliographic classification for the subject of the work. At the bottom of the card to the right is the running publication number of the cards.

The publication of cards allows bibliographic cards that are prepared at different times to be classified and kept in the order of the Universal Bibliographic Repertory into which they can eventually be incorporated in a single sequence with cards deriving from other publications prepared according to the same methods.

Subscription to two copies of the card edition of the *Bibliographie de Belgique* allows one copy to be classified in an *Idea Catalogue* (or by subject) which is arranged according to the order of the numbers of the decimal classification and one in a *Name Catalogue* (or by author) which is arranged according to the alphabetical order of authors' names. In each of these catalogues, works under the same number or the same author's name are arranged chronologically.

Annually, there are about 3,000 cards in the card edition of the *Bibliographie de Belgique*. The annual subscription has been put as a start at 20 francs a set, plus 4 francs for carriage costs in the countries of the Postal Union. The cards are sent monthly to subscribers in numbered fascicules through the good offices of the International Institute of Bibliography [1].⁶

Procedures for the formation and classification of card catalogues have been described in the comprehensive volume which the Institute has published called, *Manuel du Répertoire Bibliographique Universel*, an abbreviated edition of which has also been published (*Manuel abrégé*).⁷

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[1] For all information contact the Institute, 1 rue du Musée in Brussels.

The International Congress of Publishers, which since 1897 [2] has been kept informed by the International Institute of Bibliography about the subject of universal bibliography, has responded with a resolution that national bibliographies should one day become the basis for the creation of a *Universal Bibliographic Repertory*.⁹ The *Bibliographie de Belgique* in every way meets this requirement, for, if the method adopted for its publication were applied to other national bibliographies, it would only be necessary to assemble and merge the cards deriving from these various bibliographical sources to create the Universal Bibliographic Repertory from such elements. The publication which we present for the examination of the Congress, it should be noted, displays the following characteristics:

1. The *Bibliographie de Belgique* is the cooperative work of various groups whose aim is to establish an excellent national bibliography for Belgium. The State is represented by the Ministère de l'instruction publique whose responsibility is to see that national literary and scientific publication is inventoried on a daily basis and brought to the attention of all interested persons both within the nation and outside it. Publishers and booksellers are represented by the support of the Cercle de la librairie. The National Library (the Royal Library) uses this Bibliography as a list of all the works officially acquired for its collections. Finally the International Institute of Bibliography sees to it that the international and universal goal is adhered to as well as the purely national one. The cooperation of all these interested bodies contributes in important ways to the development of the work; it makes use of all these contributions, coordinates them and avoids duplication.

2. The *Bibliographie de Belgique* is complete. It covers the whole field of Belgian publication: books, periodicals, periodical articles. In this respect it offers a rare example in relation to other national bibliographies which, in general, have so far neglected the indexing of periodical articles.

3. The *Bibliographie de Belgique* is arranged systematically by subject. Its classification is based on the Universal Decimal Classification which is recommended by the International Institute of Bibliography for universal bibliography and is applied in the prototype *Universal Bibliographic Repertory* being developed under the aegis of the Institute; this now comprises more than 7 million cards [3]. The basis of this classification is the designation of subjects by a permanent number taken from the tables of the bibliographic classification in which all areas of knowledge (science, philosophy, art, technology, etc.) are listed in a systematic arrangement [4]. This classification, whose origins are American (Melvil Dewey), has been developed from edition to edition until in its present form it contains 33,000 headings or divisions. Thus it now permits extremely detailed classification, a condition for which workers are particularly grateful.

From the scientific, practical, and international points of view, the classification numbers have numerous advantages: the numbers permit the replacement of an

[2] See *Actes du II^e congrès*, Brussels, 1897. Mr. Zech du Biez has been drawing the attention of the Congress to the International Institute of Bibliography since 1896.⁸

[3] On the present state, organisation and extent of work completed on the Universal Bibliographic Repertory see the *Manuel* [See Editor's Note 7 below].

[4] See "Exposé de la classification décimale" in the *Actes du I^e congrès des éditeurs*, p. 44 (the report of Mr. Zech Du Biez on the necessity for systematic classification in publishers' catalogues), and in the publications of the International Institute of Bibliography, especially its *Manuel du Répertoire Bibliographique Universel* which contains the developed tables of the bibliographic classification.

alphabetic arrangement, in which subjects are scattered by chance according to subject terms, by a systematic classification preferred by scientific men. The numbers have the necessary precision for getting a vast encyclopedia into order and for searching within it. They have the brevity required for addition to bibliographic entries without overburdening them. Finally, they are international and universally understood. Thus only the index of the classification needs to be translated into different languages, whereas the bibliographic entries, because of their decimal classification index numbers, can be utilised in catalogues intended for persons in any country who are familiar only with their own national language.

4. *The Bibliographie de Belgique* is published simultaneously in a card edition and in book form. The use of the card system is becoming increasingly common because information is being continuously produced by a multitude of sources and must be kept up to date. This is very much the case in bibliography. Already it is important for a national bibliography to be able to organise entries for works issued in a particular country in a single arrangement according to one classification system, whether it be alphabetic or systematic. What delays are avoided when searching can be done in one place instead of having to be repeated in the monthly fascicules of ten or twenty years of publication! But when it comes to universal bibliography it is invaluable to be able to extend this fusion of bibliographic elements published in each country so that only a single repertory is created. This can be made available in all important centres to scholars and to the commercial book trade either in its entirety or in parts limited to particular periods or branches of knowledge.

The format of the cards of the *Bibliographie de Belgique*, 125 x 75mm, is now an international format widely adopted in America and England, and which, on the continent, has gradually won out over other extremely varied and nonstandard formats. Publication on cards of this size has been adopted for all the publications of the International Institute of Bibliography and its affiliated groups, most notably the Concilium Bibliographicum in Zurich which has printed more than 160,000 different cards of this type. This format has also been adopted by the Library of Congress in Washington which so far has published more than 180,000 different cards for its own catalogues and the catalogues of American libraries. It has been proposed that the same method be followed in Germany for the publication of the *Gesamtkatalog* of the libraries of the Empire and in England for the union catalogue of English libraries [5].

5. As a set, the cards of the *Bibliographie de Belgique* can stand alone as a catalogue that is sufficient unto itself, but the cards have also been prepared in strict relation to the *Universal Bibliographic Repertory*. The cards are arranged in boxes or card-drawers; they are then divided into groups separated by guide or divisionary cards which are higher than and of a different colour from the bibliographic cards strictly speaking. This makes searching easier. The catalogues thus formed should be thought of as a book but in a continuous, loose-leaf format having three parts:

[5] See *L'Etat actuel de l'organisation bibliographique internationale*, 1905, a report presented to the International Congress of Publishers (Milan 1906) by P. Otlet (Brussels: Headquarters of the Institute). At the July 1905 Congress in London for the Convention of the *International Catalogue of Science*, publication on cards was strongly recommended by several delegates and a resolution for this was adopted. In Italy the late Commander Desiderio Chilovi vigorously supported the use of the international card.¹⁰

A. Brief explanation, a kind of introduction where what generally precedes or follows a bibliographic compilation can be found, such as title, preface, method used, table of contents, index, relation to similar works, etc.¹¹

B. Subject catalogue arranged systematically according to the Decimal Classification. On the verso [*sic* for recto?] of the divisionary cards extracts from the classification tables are printed and this considerably facilitates searching.

C. The author catalogue in which the same cards as those for the subject catalogue appear again but are arranged alphabetically by authors' names.

Thus organised, bibliographic repertoires like the one we now present to the Congress, even though it is limited to the bibliography of Belgium, are capable of incorporating all other bibliographic elements. The arrangement is elastic: it is capable of accepting entries from any source providing that they have been prepared according to the same method.

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In its present form, the card edition of the *Bibliographie de Belgique* is such that it is able to provide important services. Librarians will gain valuable savings of time by incorporating directly into their catalogues printed cards for the new works which their libraries acquire. Booksellers will be able to create in their own work-rooms classified subject and author catalogues that are always up-to-date with the latest publications and can use the catalogues to give their clients accurate and timely information. It will also be possible to keep readers and researchers, as well as scientific or educational establishments, informed on a daily basis of all current Belgian publishing and in a form directly usable in their own files [6].

We intend to distribute the card edition of the *Bibliographie de Belgique* free of charge to a certain number of foreign libraries as a form of publicity for our national works. Publication on cards of a section on forthcoming books is being studied. Published as annexes to national bibliographies, publishers announcements have the great inconvenience of not being classified. On the other hand it is difficult to deal with prospectuses and circulars of differing formats. A kind of duplicate card has been prepared containing, in addition to the bibliographic entry, a short summary of the work and how it can be obtained by the public, as well as a detachable order form for sending to the publisher. These *summary cards* would be sent to subscribers to the *bibliographic cards* and would be classified in the same way in their catalogues. They could also be more widely distributed than this. Thus, these catalogues could also constitute a very important and permanent medium of publicity by means of which supply could be put in touch with demand.

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[6] See the specimen cards in the envelope at the end of this brochure: (1) Title card for the Universal Bibliographic Repertory; (2) An index card for the classified part; (3) A Book card with an order request; (4) a dispatch card.¹²

Card catalogues are a superior format for national bibliographies that cannot help attract the attention of those interested in the subject. Of course, it is important not to belittle the usefulness and use of compilations published in volume form, but these do not meet every need. They do not fulfil the requirements of rapid, complete, current documentation. National associations of publishers should take the initiative in these matters. Representing those who produce books, they must become involved in everything which helps in the distribution of the books produced.

Insofar as the quantity of intellectual works is growing (the figure is 150,000 books produced annually throughout the world), and insofar as intellectual relations are multiplying between nations, it is increasingly necessary to give some organisation to matters related to the book and to try to use this vast output for the greatest good of all.

A Universal Bibliographic Repertory, conceived of as the union of national bibliographies prepared according to the methods used in the *Bibliographie de Belgique* seems to be something which will endow Humanity in the twentieth century with a permanent organisation for intellectual exchanges.

Editor's Notes

1. Paul Otlet and Ernest Vandeveld, *La Réforme des bibliographies nationales et leur utilisation pour la bibliographie universelle*. Rapport présenté au Ve Congrès International des Editeurs, Milan, 1906. Bruxelles: Administration de la *Bibliographie de Belgique* and L'Institut International de Bibliographie, 1906, 8 pp.

Ernest Vandeveld, 1863-1934, was Honorary President of the Cercle belge de la librairie, and President of the Syndicat des éditeurs. He was a director and then Managing director of the firm, Etablissements de l'Imprimerie Emile Bruylant. He had a particular interest in copyright.

2. Henri Morel, 1838-1912, a Swiss lawyer, joined the International Office for the Protection of Intellectual Property (Headquarters of the Berne Copyright Union) in 1888 and became Director in 1892, serving the cause of international copyright protection for the next 20 years. In 1901 Morel undertook to organise at Berne a permanent office for the International Congress of Publishers which had first met in 1896. He resigned as Secretary-General of the International Congress of Publishers in 1910 (Miller, pp. 17-18 and 23).
3. A numbered list of the resolutions taken by the Congrès international des Editeurs appears in the general report of the 5th Congress in Milan at which Otlet and Vandeveld's paper was read ("Liste des résolutions votées par les quatre premières sessions du Congrès international des Editeurs tenues à Paris, Bruxelles, Londres et Leipzig," Congrès international des éditeurs, cinquième session Milan, 6-10 Juin 1906, *Rapports*. Milan: Associazione Tipografico-Libraria Italiana, 1907. pp. 17-36). The numbering of the resolutions given by Otlet and Vandeveld corresponds to the numbering given in this list.

4. From 1895 the *Bibliographie de Belgique* was published by the Cercle de la Librairie et de l'Imprimerie and the Ministère de l'Intérieur et de l'Instruction Publique. In 1896 to the parts for books and periodicals a third part, "Classified Indexes", was added. One section of this gave brief entries for all books for the year classified by the UDC; another section did the same for periodical titles and a third section was a classified index of periodical articles, "Tables des Sommaires." In 1897 UDC numbers were included in the main entries for books. No introductory matter describes the various changes between 1895 and 1899. An introduction to the volume for the latter year, however, announces "The transformation of the *Bibliographie de Belgique*." The title page now notes that the work is published "with the support of" the International Office of Bibliography and Vandeveld is listed as Editor.

The card edition, begun in 1906, was suspended in 1914. In 1911 the whole work was transferred to the Bibliothèque Royale and Vandeveld's connection with it ceased, though the IIB contributions remained. After the war these were limited to the preparation by Louis Masure, OIB Secretary, of a "Bulletin des articles de fond." This continued the "Bulletin des sommaires" but, unlike it, had no annual indexes and is now of little use. It ceased to appear in 1926.

5. The Library of Congress announced its Card Distribution scheme in October 1901. Libraries could subscribe to copies of printed sets of cards for books catalogued for the library. Sets of all LC cards were sent regularly to Brussels to the OIB until war broke out in 1914.

The Concilium Bibliographicum issued card versions of its major bibliographies: *Bibliographica anatomica* (also published as a supplement to the *Anatomische Anzeiger*), *Bibliographia physiologica* (also published as a supplement to *Zentralblatt für Physiologie*) and *Bibliographia zoologica* (also issued as a supplement to *Zoologische Anzeiger*).

As part of the Preussische Gesamtkatalog, the Prussian State Library in Berlin began to publish its list of accessions in 1892. In 1897, the ten Prussian Universities were asked to supply entries for their accessions of material that was dated 1898 or later (earlier material for the union Catalogue was to be dealt with by other procedures - see Editor's Note 2 to the previous paper in this volume "On a New Form of the Book . . ."). These lists were eventually known as "Titeldrucke." As an exercise in central cataloguing, it was proposed to use the type set up to print the lists also for printing cards. In 1909, the international format for cards was adopted but because entries were prepared according to the Prussian cataloguing code, the Prussian Instructions (Instruktionen für die Alphabetischer Katalog der Preussischen Bibliotheken, 1899 and revised 1908), the cards were in fact of little use outside Prussia.

6. The card edition was despatched to subscribers in cardboard drawer-like boxes with rods. Each box contained about a thousand cards representing entries published in a group of the fascicules of the regular edition (for example the British Library has 19 boxes comprising the cards issued from 1906 to 1913). The cards were arranged in

UDC order within each fascicule. Each box contained a series of preliminary cards containing information on the IIB, illustrations of its repertoires, information about its organisation and methods, the services it offered, its publications and so on. Much of this information had been printed and then cut up and pasted on the cards. The impression is of a very professional enterprise.

7. *Manuel du Répertoire Bibliographique Universel: Organisation. Etat des travaux. Règles. Classification.* (Publication No. 63; Bruxelles: IIB, 1905-1907). The first 176 pages deal with the organisation, work and methods of the OIB. The next 32 pages describe the classification and present rules for cataloguing and classifying. The classification schedules follow on 1409 unnumbered leaves. Issue of the *Manuel* was in fact begun in 1904 and revisions were presumably incorporated into it until 1907. Each copy is numbered and dated.

Manuel Abrégé du Répertoire Bibliographique Universel: Organization. Travaux. Méthodes. Tables abrégés de classification. (Publication No. 65; Bruxelles: IIB, 1905). The introductory matter is the same as for the larger work, but the Classification Tables are abridged and give numbers only up to 3 figures.

8. Guillaume Zech du Biez, 1844-1904, was a printer who had been Vice-President and President of the Cercle Belge de la librairie et de l'imprimerie and at one time President of the International Publishers' Association. His major work, issued in fascicules, was a chronologically arranged descriptive bibliography of Belgian almanacs. It is interesting to note that, while Otlet and Vandeveld mention Zech's work as a publicist for the Decimal Classification at the meetings of the International Publishers' Association, Vandeveld was himself active in this group and was *rappoiteur* for the 1901 Leipzig meeting.
9. The attitude of the International Congress of Publishers towards Otlet's cherished schemes waxed and waned. At its first meeting in 1896 in Paris a resolution along the lines mentioned here was taken. At the Milan Meeting of 1906 to which this paper was presented there was "a skirmish between the partisans and adversaries of the decimal system (Dewey)," Otlet and supporters taking one side and a prominent French book-trade bibliographer, Henri LeSoudier, taking the other. As the slightly ironic commentator in *Droit d'auteur* observed: "The adoption of the general resolution proposed by the *Rapporteur....* put an end to the tournament". ("Congrès international des éditeurs. Ve session, Milan, 5-10 Juin 1906," *Droit d'auteur* 19 (1906): 86).
10. Desiderio Chilovi had been the Librarian of the National Central Library of Florence and had supported the IIB in its early days. An article of his in the *Bulletino delle Publicazioni Italiane* had been translated as "La Coopération nationale et internationale au Répertoire Bibliographique Universel" *IIB Bulletin* 1(1895-6): 320-324.

Entries for the various subject volumes of the *International Catalogues* were prepared on paper slips of a uniform size at the Regional Bureaux that were set up in various countries for this purpose. The slips were then sent to the Central Bureau in London for checking, final editing and amalgamation for printing in volume format.

The first 17 volumes appeared in 1901. None of the *Catalogue* was issued in card format.

11. It should be remembered that what is being described here is the order of the elements of books published in French where typically the Table of Contents comes after the body of the text and before the index (if there is one).
12. The envelope with the specimen cards Otlet and Vandeveld mention in their footnote is formed by a large piece of cardstock of the same light weight and colour as the brochure's cover and is pasted on the recto of the back cover. The Title card is salmon in colour and lists the three parts of the Universal Bibliographic Repertory as follows: Section A - Administrative Part (Organisation. Elements); Section B - Subject Repertory (Classified decimaly); and Section C - Author Repertory (arranged alphabetically). The divisionary card for the "Repertory Classified by Subject" is blue and lists the ten main classes of the Decimal Classification on the recto. Finally, there is a folded piece of white cardstock which is the announcement of a forthcoming book or analytical card. One half of this has the bibliographic entry for a sample book along with a fairly extensive abstract of it, the other half being the order blank to be detached along the fold. The order blank is essentially a postcard with printed details on one side with blanks for requester's name and address. The other side has the publisher's name and address.

8. THE SYSTEMATIC ORGANISATION OF DOCUMENTATION AND THE DEVELOPMENT OF THE INTERNATIONAL INSTITUTE OF BIBLIOGRAPHY.¹

1. The General Idea of Documentation

Today Documentation is understood to mean bringing into use all of the written or graphic sources of our knowledge as embodied in documents of every kind, though chiefly printed texts. These documents consist of whatever represents or expresses an object, a fact, or an impression by means of any signs whatever (writing, picture, diagrams, symbols).

Knowledge and impressions would last for only a limited time without the help of graphic documents to capture and hold them fast because *memory* alone is insufficient for recollection. Memory has a narrow scope as well, for the *spoken word* serves as a means of communication only within a very limited circle.

In a general way, one can say that documents of all kinds, the production of which began centuries ago and continues unceasingly in all countries, are registering or have registered, day by day, all that has been discovered, thought, imagined, planned. Thus, they constitute the means by which all of this has been transmitted from generation to generation and from place to place. As a whole, then, documents form the graphic memory of humanity, the physical body of knowledge.

2. Use of Documents and the Documentary Method

The *documentary method* consists in having recourse to documents in order to extract facts and information from them for the acquisition of knowledge, for study or for scientific research. It complements other methods of investigation: observation, experimentation, deduction. Supported by integrated and up-to-date documentation (libraries and collections), helped by instruments of research (catalogues), exercised according to rational and thoughtful procedures (criticism of sources), the documentary method actually allows one to have the assistance of all who have previously worked on the same subjects and to follow their research to the point where they stopped. Thus it makes division of labour possible and allows for the full use of what has already been discovered.

Documentation, therefore, has a position next to Education and Scientific Research. The work of Science lies in the investigation of new facts. It leaves to others the task of preserving and using its results. The task of Education is the gradual, systematic shaping of the intellect in school and university. The aim of Documentation is rapidly and easily to provide all researchers, whatever their level of knowledge or

culture, both with the materials of study which represent the totality of human experience and with detailed information on particular points. In scientific, technical, historical, social and industrial matters, it is the systematically organised intermediary between the public and documents, between those who read and those who write. It provides recorded information, that is, the distribution of information by the book, periodical, newspaper, and photographic image.

3. The Divisions and Branches of Documentation

The following distinctions must be made so that the scope and several aspects of Documentation can be made better known.

A. *From the point of view of graphic documents* one can distinguish:

1. Written documents or texts (books, periodicals, newspapers, manuscripts, archival pieces, etc.)
2. Pictures (engravings, drawings, photographs, etc.)
3. Ideograms (maps, plans, schemas, diagrams, etc.)
4. Music (parts)

B. *From the point of view of the subjects dealt with* (sciences, branches of activity, knowledge), Documentation can be divided into the following classes:

1. Knowledge, Books and Documentation in General;
2. Philosophy and Ethics;
3. Religion, Theology;
4. Social Sciences, Administration, Law;
5. Philology and Linguistics;
6. Mathematics, Physical and Natural Sciences;
7. Applied Sciences: medicine, engineering, various industries;
8. Fine Arts, Sports;
9. Literature and Belles Lettres;
10. History and Geography.

C. *From the point of view of using documentation* we must distinguish:

1. Collections of individual documents as they are originally produced and published by their authors;
2. Documentary work based on groups of documents such as bibliographic indexes and catalogues;
3. Documentation services comprising on the one hand collections and catalogues and, on the other hand, a staff responsible either for developing these collections and catalogues or for using them to provide the public verbally or in writing with all of the information that it requests.

The connections between the different branches and divisions of documentation are so close that in practice it is impossible to make any clear distinctions between them. On the contrary, in treating them as various elements of an enormous whole and in

systematically organising them in light of a common purpose - integrated information - it is possible to achieve considerable economies of effort.

Isolated collections of documents without catalogues constitute inaccessible treasures. Conversely, catalogues without documents are sterile inventories of treasures because they cannot be used. All of the branches of knowledge interpenetrate and none of them can be developed separately as though it could exist by itself without need of reference to any other. On the contrary, each of the branches of knowledge is related to every other and they owe the better part of their progress to their interconnections. It is also necessary to recognize that speculation and results, theory and practice, study and action constantly react one against the other. Science instructs art and industry, but they, in their turn, provide new materials for science.

The different kinds of graphic documents are only different means of expressing the same things. It does not matter in what form information is transmitted. What is essential for researchers is to collect information that is precise, plentiful, accurate and up-to-date.

4. Necessity for a Systematic Organisation

The need to organise documentation systematically arises from the following circumstances:

1. Large masses of documents exist and continue to be published every day. The diffusion of culture in all countries, the development of science and the arts, technological progress, and the increasing numbers of social relationships of all kinds are responsible for this intellectual output. About 150,000 new books and from 400,000 to 500,000 periodical articles appear annually. An exploratory study has established that prior to 1900 this output was a minimum of 10 million books and 15 million periodical articles;²

2. Documents are not centralised in a few great depositories but are scattered in libraries throughout the whole world. Certain national libraries - those in Paris, London, Berlin, Washington - hold from one to three million volumes. Special libraries have been created wherever separate study centres exist - in universities, schools, museums, observatories, parliaments, government departments, scientific associations, etc. Public libraries, lending libraries, and so-called popular libraries are scattered over the entire surface of the globe and number several thousand in the major countries;

3. The inventorying of documents leaves very much to be desired. Catalogues do not exist for a great many libraries or they are published only after considerable delay and are not kept up to date. They are always limited to particular collections and rarely contain indexing for periodicals. Some periodicals only publish tables of contents and it is unusual for these to be complete, to be cumulated after several years and classified in detail. National or special bibliographic compilations are not created according to any integrated plan which would allow them to be considered to be parts of the Universal Bibliography. They are fragmentary, frequently interrupted and abandoned. Like library catalogues, they have their own classifications and editorial procedures and are published in various languages, all of which make consulting them very complicated. As for booksellers and publishers catalogues, these deal only with particular collections and are commercial in character. Nevertheless, the number of these various bibliographic sources

has risen to more than 40,000. Even though taken all together they would actually constitute the Universal Bibliography, it is impossible to have them assembled in one place. This is what always makes the research needed to prepare a complete list of documents about a particular subject (the literature of a subject) a delicate task, full of difficulty, delay and uncertainty, and consequently impossible to do for a great many people;

4. The documentary methods of the past are unable to produce an effective organisation of collections or of research instruments. They are dominated by particular, individual points of view in the way they are edited, arranged and published. The works were undertaken without any overall programme, links or cooperation;

5. The need for recorded information, however, increases in proportion as contacts increase, as work becomes more international, as undertakings become more distant from each other, as general ideas assimilate all individual ideas and become more universal, and as the social action of individuals and groups becomes more interdependent. These facts determine the present situation of scholars, of those persons responsible for education or in professional occupations (engineers, physicians, lawyers, industrialists) or responsible for the management of public affairs (legislators, administrators, civil servants, etc.);

6. Even though bibliographies draw the existence of documents to the attention of researchers and libraries make them available, documents constitute, it must be said, materials in a rough state. The same facts are so often repeated in them and in such different ways that it would be a waste of time to require the great majority of researchers to read or to consult everything. Documents contain simultaneously what is definitely false and what is accepted as true, what is outdated and of only an historical interest and what is current and of practical usefulness.

For all of these reasons it is necessary to provide researchers with guides to the mass of scattered documents and thus to organise documentation.

5. General Basis for and Characteristics of the Organisation

The organisation of documentation should be based on the following:

1. *Universality of Documentation.* All kinds of documents, all documents taken individually and all the genres of documentary work must be included. The Organisation should be undertaken gradually, beginning with those aspects that are most useful and most easily realisable.

2. *Collections.* Documents (writings, books, images, photographs) must be assembled and arranged to form collections, that is systematic, organised wholes that are as complete as possible (libraries, picture libraries and so on) and agreements for exchange and use should be set up between these collections.

3. *Repertories.* The documentary work to which documents are subjected in order to make their existence known and to facilitate knowledge of their contents, must result in a variety of catalogues. Each should be considered an aspect of integrated documentation and as able to be combined in such a way that they are all complementary. Repertories should be formed from separate entries which are prepared individually so that they constitute so many single, identical units, recorded on separate leaves or cards. Repertories should be indefinitely extensible and kept up to date by

current publishing. They should be classified in such a way that their contents are made accessible by means of numerous and varied entry points.

The primary objective of documentary work should be the listing and description of documents in such a way that an instrument of research is created by means of which all documents of the past, the present and the future can be regarded as chapters, sections and paragraphs of a single book containing all of Knowledge and Thought. The Universal Bibliographic Repertory, the living product of individual bibliographies, will be considered to be the immense table of contents of such a book.

Next, documentary work should have the objective of analysing and summarising documents, of coordinating and codifying their contents. The systematic reading of works by a few for the benefit of all will permit the extraction of results that are scattered in innumerable sources. Original ideas (facts, theories, methods, plans) can then be amalgamated in the uniform and impersonal structure of a kind of Universal Book, the *Permanent Encyclopedic Repertory*, a manuscript register that is kept up-to-date by all the information that has been collected. It will be a systematic compilation divided into as many sections as there are branches of knowledge and incorporating the original elements of each document. Its cooperative organisation will guard against any limitation, exclusiveness or bias.

4. *Standardisation and Internationalisation of Methods.* Repertoires and collections must be created according to a standard methodology that includes simultaneously the form of documents, their arrangement, classification, preservation, and communication. This method must be applicable internationally.

The two-fold basis of the documentary method consists first, in the *card* which allows each item of information to be recorded separately in any place and at any time in a standard, even if distributed, manner, subsequently to be integrated into a single sequence made up of similar elements. Second, *Classification by subject* which allows each document and each card to be assigned a permanent class number which determines its special place in the encyclopedic structure of general documentation.

5. *Cooperation.* The organisation must enlist the widest collaboration from individuals as well as institutions in all countries and in all branches of knowledge and activity. Only thus will so considerable an undertaking, which is directed to the whole world and utilises materials drawn from everywhere, be brought to a successful conclusion. It is important that the international organisation of documentation be permeated by a truly universal spirit.

6. *Concentration and Decentralisation. Federation.* The collections and repertoires built up in this way should increase in number and become as extensive and complete as possible. The results of universal cooperation must be made as widely available as possible. The organisation should cover all countries and all the great centres in a vast network of documentation services that, though more or less fragmented, are set up by the separate groups (institutions or individuals) according to standard methods. These institutions will be linked to a central International Institute, which is conceived of as a federative organ, the emanation and representation of all of the separate groups. This institute will have to direct cooperative work, divide up the tasks, encourage support, supervise the maintenance and development of the methodology and organise general services common to all groups (exchanges, inventories, etc.). Finally, it must ensure the conservation and use of prototype examples of the collections and repertoires. These

examples are needed to achieve physically the consistency required in one place and to maintain it in the collections and repertoires distributed elsewhere.

6. The International Institute of Bibliography

The International Institute of Bibliography was founded in 1895 as a purely scientific institution inspired by the considerations listed above. Because of the help of the governments, associations and individuals [1] and the support offered it by international congresses [2], it has gradually matured until now an appropriate goal for it seems to be that of becoming the institution responsible for organising documentation internationally. This task requires a permanence, continuity and amplitude of effort beyond the power of individuals or even groups in a single country.

The objectives of the institute are as follows:

1. The study and diffusion of all theoretical and practical matters of concern about Documentation in general and about its various branches in particular; the elaboration of a general documentary methodology;
2. The creation of systematically formed collections of documents and the development from a universal point of view of repertoires whose purpose is coordination and accessibility of documents [3];
3. The organisation of cooperation in relation to the formation and use of these collections and repertoires. For this purpose, achieving an agreement between various regional, national and special documentation services, and most especially with international organisations, and the affiliation of these services and institutions to the Central Institute.

Conclusions

Organised on the basis just discussed, Universal Documentation through its collections and its various repertoires would truly become a "World Memory." This would not be limited to recording facts, but would automatically and instantly permit their retrieval. It would be a vast intellectual mechanism designed to capture and condense scattered and diffuse information and then to distribute it everywhere it is needed.

From the point of view of scientific work, the organisation described above would constitute an enormous application of the ideas of cooperation and the division and coordination of effort. In developing the habit of collaboration, it would gradually introduce more consistency, more agreement, and more integration in future scientific work. From the international point of view, it would constitute an undertaking of capital importance in ensuring the extension and continuity of intellectual relations.

[1] See below the chronology of facts related to the development of the International Institute of Bibliography.³

[2] See below the text of the resolutions related to universal bibliography of international congresses.⁴

[3] See below the notices about the repertoires, collections, and publications of the International Institute of Bibliography.⁵

Editor's Notes

1. *L'Organisation systématique de la documentation et le développement de l'Institut International de Bibliographie.* IIB Publication No. 82; Bruxelles: IIB, 1907. pp. 7-15. This publication is unsigned and consists of the section translated here together with the sections described in Editor's footnotes 3, 4, and 5. It also appeared in *IIB Bulletin* 12 (1907): 3-11.
2. Referred to here are two studies: Paul Otlet, "La Statistique internationale des imprimés, quelques sondages," *IIB Bulletin* 1 (1896): 300-319; and Paul Otlet, "La statistique internationale des imprimés," *IIB Bulletin* 5 (1901): 109-121. An extended study of this subject was presented to the 1910 International Conference of Bibliography in Brussels on behalf of the IIB by B. Irwinski ("La Statistique internationale des imprimés: résultats généraux," *IIB Bulletin* 16 (1911): 1-139).
3. "Chronique des principaux faits relatifs au développement de l'Institut International de Bibliographie," pp. 35-50. This is detailed and rather discursive account invaluable for the history of the IIB.
4. "Resolutions des congrès," pp. 51-64. this is arranged by year and contains the resolutions *in extenso*. As well as the various conferences of bibliography, publishers and so on are such resolutions as that of the 3rd International Congress of Hygiene and Demography in Brussels in 1903 that an International Bibliography of Hygiene and Demography be created. The resolutions of the 1906 International Congress on Photographic documentation are particularly long and detailed. (See Paper No. 6 "On a New Form of the Book..." in this volume)
5. "Répertoires, collections, publications, services de l'Institut International de Bibliography," pp. 17-33. This is particularly interesting in giving full description of the various repertoires being elaborated at the time. The 'unitary' Universal Bibliographic Repertory had about 14 component repertoires.

9. THE UNION OF INTERNATIONAL ASSOCIATIONS: A WORLD CENTRE¹

The organisation of the world is due to a vast and continuous movement which, remote in its origin, has, of late years, acquired an immense impetus. It tends to stimulate more cooperation among similar groups in all countries, insures a greater acquisition of knowledge and of technical expertise throughout the world, promotes the unification of methods and international agreements on all subjects wherever possible and desirable.

International Associations have become the centralising organs of this movement. Whether official or private, created by the union of States or formed by the drawing together of national federations on their own free initiative, it is to them that we owe results which have transformed the world's mode of living: the world's postal service; the extension of the decimal metric system to all nations; the coordination across frontiers of railway services and navigation; international law applicable to all judicial relations of persons and property; arbitration between nations substituting the reign of peace for the arbitrament of war; the interparliamentary discussion of great world interests; co-operation, charity and insurance extending solidarity and fraternity to all countries; public health protected from great scourges by concerted hygienic measures; works of art and books protected, exchanged and lent internationally, and documents made universally available; science studied in common, and, by the contributions of results obtained by workers in all countries, constituted into a universal synthesis of knowledge.

At the present time there are about 400 International Associations in actual operation. Because of the variety of their aims they cover practically every field of study and activity. Each of them endeavours to collect into a central organisation, generally of a federative character, the most representative forces in their own particular domain from the different countries.

The activity of these Associations is continually made evident in meetings and congresses, publications, enquiries, petitions, contributions and communications, collections and joint services; in incessant publicity for their ideas. They all tend towards cooperation of effort, concerted reforms, and general progress. In this way, the International Associations constitute so many centres of World Life.

At first, during the long period in which they remained isolated, these Associations carried out their separate programmes without seeking to coordinate their ideas and action or to cooperate with one another. Coordination and cooperation became imperative, however, as a natural consequence of their work of self organisation. Once they had placed all their national groups in close communication, once they had united these forces into a universal bond and began to act according to shared views and mutually agreed on plans, it became necessary for the International Associations to consider what relations they could establish between themselves, to realise the extent of their fundamental solidarity, and to understand

that they formed parts of a larger whole which embraces the entire social functions of mankind.

The Union of International Associations sprang out of the movement for connecting these bodies. It was constituted in 1910 by a World Congress at which there were delegates from 132 international organisations. The scheme had been prepared as far back as 1907 by the Central Office Of International Associations, the foundation of which was suggested at Brussels by the leading men of several associations which had their headquarters in that city. Since 1910, the Central Office has become the headquarters for the Union [1].

The essential aim of the Union, as defined by its organisers, is to bring the International Associations together in order to pursue the systematic organisation of International Life in all its branches. Its object is to extend and coordinate international cooperation in the domain of all scientific, technical and social activities by developing the more than 400 international associations now existing, by harmonizing their programmes and their work, and by maintaining a world centre for their general services.

The Union attains these objectives by the following means:

a) Organising representatives from all of the international associations into a federated body (the Union holds periodic congresses and carries out its resolutions through a central executive office).

b) Consolidating the work done by the several associations through the establishment of universal systems, namely:

1. Standardisation (legal standards of weights and measures, efficiency methods, etc.)
2. Regulation (standard contracts, international rules and conventions, etc.).
3. Terminology and language (technical and scientific nomenclature, notations, classifications; rules for the use of national languages in international relations).
4. Publication and documentation (system of synthetic and coordinated publication, recording of international literature; international use of the great storehouses of publications and documents).

c) Forming international collections:

1. International Museum (comparative and national sections).
2. International Library
3. Cyclopedical Archives.
4. Universal Bibliographic Catalogue.

[1] See inter alia *The Union of International Associations*, publication no 25a of the Central Office, and the articles by Messrs. La Fontaine and Otlet which constitute the introduction of the *Annuaire de la vie internationale*, and of the review, *La Vie internationale*.

d) Creating and administering a headquarters for international associations already existing, and for those not having any permanent office.

e) Issuing Publications dealing with facts, ideas and the organisation of international life:

1. Monthly review: *La Vie internationale*.
2. Year Book: *Annuaire de la vie internationale*.
3. General code including the desiderata and the resolutions of International Congresses

The Union receives contributions from the affiliated international associations in proportion to their means. The Interparliamentary Union provides a yearly subvention of 1,000 francs and the Carnegie Endowment for International Peace a yearly subvention of 15,000 dollars. Voluntary gifts from benefactors interested in world organisation have contributed to the progress of the collections.

The World Congress has adopted a motion to the effect that all governments should be requested to give moral and material support to the Union and to organise national sections representing the best forces in their respective country.²

I. Co-operation between international associations: A World Centre

The Union invites Associations to deliberate in general meetings, where important issues, common to the whole of humanity, may be brought forward; to formulate unanimous views; to act to achieve greater force and harmony by avoiding duplicated or isolated efforts; and thus to bring about unity of methods.

Instead of engaging in work having no relation with what has been done up to the present, the Union proposes to act in concert with Associations already existing and operating, and to make use of them. It proposes that together they should set up an International Centre which is both an *Intellectual Centre* of ideas, methods, exchanges, relations and propaganda, and a *Physical Centre* of collections and of persons devoted as much to the study as to the management of affairs having a world-wide and universal character.

The existence of a Centre assures both continuity of work and international collaboration. It provides a milieu conducive to comparative studies, to the diffusion of new ideas and to the multiplication of relations. Essentially neutral, extra-national so to speak, in a manner extraterritorialized, here the representatives of each nation in the various branches of study and action can consider themselves at home and not the guests of another nation.

The Centre must create the sympathetic and non-partisan atmosphere necessary for the production and development of ideas and initiatives of world-wide influence. In the Centre all international interests may be discussed frankly and openly but with mutual respect. A great deal of this programme is now being carried out as shown by what follows.

II. The Publications of the Union of International Associations

The Union has undertaken several publications which form a series whose parts are all completed by one another. They are the *Annuaire de la vie internationale*, a monthly review *La Vie internationale*, the proceedings of the World Congresses, and the codification of resolutions and wishes of the International Associations.

a) The *Annuaire de la vie internationale* (Annual of International Life), condenses the results of a permanent enquiry regarding International Associations, whether official or unofficial. The first volume of 1500 pages was published in 1910. The second volume of 2650 pages was published in 1912.³ These volumes contain separate entries⁴ elaborated according to the same plan for all International Associations. These entries form a first collection of facts concerning the history of each association, its object, its programme, its statutes, the work already done, the composition of its staff, and the international conventions concluded through its intervention. The reproduction of the texts of the resolutions voted by the Congresses and of the conventions signed by the States make the *Annual* a collection of the greatest documentary value. All the information is obtained from original documents which are preserved in the Archives of the Office.

b) The review, *La Vie internationale*, constitutes a monthly survey of ideas, facts and organisations related to International Life. It endeavours to show the organic nature of the movement towards internationalism and how the world community is growing. The review is a tribune placed at the disposal of the leaders of the international associations and to some extent forms a permanent World Congress. First published in 1912, the two volumes for each year cover about 1300 pages.

c) The *Codification of resolutions and wishes of International Associations* is undertaken by the Central Office. International Congresses are practically parliaments, each specializing in its own domain. Their resolutions, therefore, may be considered as special international laws. These laws are not enforced by sanctions similar to those available to enforce the laws of national parliaments. But they have an inherent power of persuasion, and in most cases command a powerful indirect sanction: moral compulsion, exclusion, or boycott.

The first part of this codification has already appeared (see proceedings of the World Congress, 1910, pp. 39-196).⁵ It coordinates principles, ideas, facts and regulations that have already been formulated on the question of world organisation by a great number of special congresses, but which had never before been brought together. The utility of such a codification consists not only in the fact of collecting scattered information, but also in giving a practical demonstration of the interdependence and solidarity of the work done by International Associations. The codification will be presented as a whole to the Governments, and in the future will result in a systematised account of all the means considered by international leaders as best for the progressive organisation of the world.

III. The International Collections

The International Centre organises International Collections of world-wide importance. These collections are the International Museum, the International Library, the International Bibliographic Catalogue and the Universal Documentary Archives. These collections are conceived as parts of one universal and international body of documentation, as an encyclopedic survey of human knowledge, as an enormous intellectual warehouse of books, documents, catalogues and scientific objects. Established according to standardised methods, they are formed by assembling cooperatively everything that the participating associations may gather or classify. Closely consolidated and coordinated in all of their parts and enriched by duplicates of all private works wherever undertaken, these collections will tend progressively to constitute a permanent and complete representation of the entire world.

I. THE INTERNATIONAL MUSEUM

The aim of the International Museum is to demonstrate the progress achieved in all fields relating to the domain of internationalism and, from a scientific and social point of view, to emphasize the importance of the facts connected with them.

According to the general idea of the Museum, it has both National and Comparative Sections. In the National Sections are assembled, according to educational and synthetic methods, all possible objects and documents showing the general aspects of the various countries or ethnic groups in order to facilitate comparative study: political and social organisations; natural and artistic wealth; economic development; civilisation and culture; participation in world life through material and intellectual exchanges; participation in international agreements whether of an official or a private kind.

The National Sections will be organised by each Government aided by an executive committee and the associations of the country. Their aim is to realize permanently at the International Centre what has already been accomplished temporarily at the great Universal Exhibitions. Taken as a whole, the halls of the National Sections should form a vast geographic and ethnographic museum, a museum of the Earth and Men.

The Comparative Sections of the Museum are formed by the International Associations, and each will there organise with the help of the Union an educational and impressionistic⁶ exhibit of the progress achieved in the various branches of science and practical activity. It will be simultaneously a Universal Museum and a Technical, Educational, Geographical, Economic and Social Museum.

The Comparative Sections will take up all that is general, universal and essentially human: the physical and psychic being of man, the place he occupies amongst his fellow men on the planet and in the universe; the history of ideas, creeds, and philosophical systems; the transformation and present state of the organisation and application of the sciences and of cooperation in research and in the diffusion of knowledge, which are the guiding principles for intellectual and physical work; the chief facts of Universal History and the various phases of civilization; the laws of the formation and development of human societies; the mechanism of production, circulation and distribution of wealth throughout the globe; the succession of great inventions; the struggle against diseases and plagues; the large undertakings that have transformed the human abode and given to men power over nature;

the means of transportation and of communication; the immense development of railways; the progressive development of the great transcontinental railway lines, the creation of what one might call a transmonial system as they have been joined together; the present state of maritime transportation, inter-oceanic canals and maritime routes; the origin, history and diffusion of the universal postal service, the telegraph, submarine cables, the telephone and wireless telegraphy.

It must be a museum of the best types and standards. It must endeavour to arrange its material systematically, and to collect what otherwise can only be found in the world at the cost of great effort, loss of time and considerable travelling.

The museum will be a world in miniature, a cosmoscope allowing one to see and understand Mankind, Society and the Universe. Formed by the combination and synthesis of all the factors of past and present progress, it will give a vision of the future.

The International Museum, begun in 1910, today occupies sixteen large halls having an area of 2640 yards. It contains 12,000 objects and documents. The arrangement of the proposed building must provide for a development appropriate to the programme which has just been discussed.

The Comparative Sections will become in time special international museums which each International Association will form for its own field. Different museums created separately by International Associations have already combined with the International Museum while retaining their individuality, for example the International Administrative Museum and the International Museum of Roads.⁷

II. INTERNATIONAL LIBRARY

The International Library has as its programme the gathering of a vast collection of books, not in response to national or local needs like other great existing libraries but guided by the principles of internationalization and universalization. Its purpose is to seek to respond to the requirements for comparative study of the International Associations.

Books are themselves the tools for all cooperative work carried out by numerous minds working in separated localities. They are by preference the tools of associations. All that is discovered, observed, and achieved takes the form of a written work which is printed and addressed to the public, to anonymous and unknown people from whom it is hoped to win approval or cooperation in one form or another. Printed matter as a whole summarizes and synthesizes all information. It constitutes the memory of humanity and registers its collective experience. Its power for the general good will be especially strengthened when its accessibility is made easier through more systematic selection and more detailed and better organised cataloguing, but also through publication procedures which are more responsive to general needs and which are placed under the control of the Associations themselves.

The constitution of an International Centre cannot be conceived without the organisation of important documentation services. These have been assumed by the International Institute of Bibliography, whose large collections are themselves the results of collective efforts.

The International Library will take the beginning of the 20th century as its point of departure. It aims at being above all a modern library without, however, with respect to

fundamental matters, excluding collections of materials relating to previous epochs. It must be constituted from collections having different origins, such as:

1. Deposit of libraries belonging to each International Association. These actually collect works and periodicals from the whole world relative to their specialty. This is fairly easy owing to exchanges, authors' presentation copies, and organised national correspondence services.

2. Deposit of collections of official publications printed by the different Governments and by administrations and scientific establishments which depend on governments or are under their auspices. This literature increases in importance as the duties assumed by the State extend, and as the principle of public powers giving aid to important scientific and social publications is generally accepted. Official publications are today already used by Governments for international exchange. From this point of view, the International Library in fact constitutes a central depository for duplicates of all publications which, according to international conventions, ought to be exchanged between the signatory Governments.

3. Donations of works by authors and publishers who will appreciate more and more the advantage of being represented by their publications in these central collections. By bringing these works in contact with the general literature on their subject, the International Library gives them useful publicity.

4. Donations of whole libraries by men of science and private persons who desire to cooperate in the constitution of a World Library and to save from dispersion the works they have collected in connection with comparative studies.

The International Collective Library was set up in 1907. Today it contains the collections of 62 affiliated organisations and includes about 75,000 works.

The number of printed items in all countries since the invention of printing is estimated at 12 millions. Periodicals and journals now number 72,000. It is from this formidable array that a selection has to be made. The constitution of an International Library of 2,000,000 items is a programme appropriate for collective effort.

III. UNIVERSAL BIBLIOGRAPHICAL CATALOGUE

The Universal Bibliographical Catalogue is the realization of a project for concentrating cataloguing work, often sketched during the last century, but carried out only since 1895 as a result of the International Conference organised by the International Institute of Bibliography.

The Catalogue constitutes a universal list of writings, books, and articles from journals, classified according to authors and subjects. It concentrates and coordinates the catalogues of the great national and international libraries of all countries and special international bibliographies, a great number of which are undertaken by international associations. It is at once the collective work of the international associations and the proper work of the International Institute of Bibliography which drew up the general rules for it.

Science cannot progress without a regular system of bibliography and of documentation which is accepted and used by a large majority of scientists in all countries.

To work systematically it is necessary, first of all, to enquire if a subject has been studied previously and what results others have obtained. This is only possible by means of a

systematic organisation of documentation, a very difficult task on an individual basis. The quantity of publications produced annually and added to existing publications, the dispersion of works in a great number of libraries, the difficulty of knowing that publications exist when they are wanted, the great number of bibliographic lists or catalogues drawn up according to different plans and of doubtful completeness, the loss of time in bibliographic investigations, the unintegrated character of scientific publications themselves - these are insuperable obstacles.

The Universal Bibliographic Catalogue which endeavours to give exact, complete and rapid information, now contains 11 million entries; it should contain 50 million to be up to date.

Its method is as follows: it is established on cards of universally accepted size, some manuscript, other printed. The classification, according to the outlines of the decimal system, is very minute. An alphabetic index enumerating the headings used for the classification's 35,000 subdivisions covers the entire field of knowledge and activity.

Each country is invited to issue, according to standard rules, a catalogue of the works published by its citizens in order to insure the direct incorporation of the titles of their works into the Universal Repertory. Each International Association is invited to prepare a systematic bibliography of the periodicals of its specialty according to the same methods. Thus an integrated catalogue of intellectual production will gradually be established and placed at the disposal of workers throughout the entire world.

IV. CYCLOPEDICAL ARCHIVES

The Cyclopedical Archives complete the documentary work of the Library and the Bibliography. This work can be considered under a four-fold aspect: first of all it is necessary to collect and classify the titles of all the writings published in the different countries at different epochs (Bibliography); then to collect the writings themselves (Library); further, all the writings ought to be reduced by a form of disintegration and readjustment into the form of files each conceived as chapters and paragraphs of a single universal book; finally, because of the abundance of documents and the frequency of repetition and obvious errors, it has become necessary to summarize and coordinate them in a Universal or Perpetual Encyclopedia.

Such an encyclopedia will be a monument erected to the glory of human thought and will be the graphic materialization of all the sciences and arts. It will have, in fact, the thinkers of all ages and countries as collaborators. It will be the total sum of the intellectual effort of centuries. It is clear that the Universal Encyclopedia should avoid all national tendencies; it must really emanate from the combined efforts of the best men of every country.

Already, with the aid of some International Associations, it has been possible to begin the work on a small scale and to form the following collections:

1. A classified collection of documentary files (Universal Repertory of Documentation) concentrating papers and documents relative to a question or a group of questions (pamphlets, articles from reviews and journals, statistical tables, maps, diagrams, schemas, commercial catalogues, laws, reports, etc.).

2. A classified collection of iconographical documents (Universal Iconographical Repertory). On each subject pictorial documentation is created in connection with the main documentary files. This work is done by the International Institute of Photography.⁸

3. A general repertory of information which is divided into as many parts as there are categories of facts to be considered. This contains information about institutions and persons (Annual of annuals), statistics, tables of legislation; abstracts of natural species; physical and chemical coefficients, patents, etc.

4. Archives of the Press which, on a daily basis, follows the production of periodicals, reviews and journals in every country. This work is done by the International Museum of the Press.⁹

IV. A Centre for International Studies and Information

The large collections brought together at the International Centre will attract from all parts of the world workers who will be certain of finding there in a few hours complete and up-to-date information for the gathering of which they would have had to spend many long days elsewhere. These workers will find in the centre common study rooms or private offices which have been especially arranged for the purpose of research.

The official documentation of every country will attract foreign commissioners delegated by their Governments to obtain comparative information on questions of general welfare.

Selected students from every country will come to the centre to complete their education and the organisation of an International University will soon become a necessity. The best professors of the world will be invited to teach in such a university. All countries will be proud to send their most clever men and to give them an opportunity of addressing large cosmopolitan audiences in surroundings of high and universal culture.

But the International Centre is not only a centre for concentration¹⁰; it is also a distribution point. The utilization of the collections on the spot is complemented by measures making them available at a distance by loan, by copying, or by reprinting. The objects belonging to the Museum may be duplicated to enrich existing collections or to form new ones. Copies of the cards of the Universal Bibliographical Repertory can be obtained on demand, whether the demand is limited to a special question or to a special language or period. The books in the Library may circulate. Photographic processes also permit the provision of exact reproductions of texts, figures, statistics, maps, and engravings at a very low price. Typewritten copies can be given of documents preserved in the archives.

The consequence is the organisation and operation of an International Bureau of Information (commerce, legislation, technical questions, social work, etc.).

The documentary centralisation aimed at by the Union of International Associations is not merely of inestimable value for personal consultation on the spot; its scope is more extensive. The International Centre will make the world known to the world. It will incite men to work together and promote their cooperation in all the domains of knowledge and action. It will provide a home for the study and discussion of the management of the great interests of mankind. It will provide humanity with a consciousness of its unity.

V. The World Palace and the Headquarters of the International Associations

The World Congress of 1913 adopted a motion to the effect that the services and collections of the World Centre should be installed in an appropriate building or group of buildings (World Palace) and that the International Associations should be assisted by the governments and individual benefactors of all countries. The following plan was presented to the Congress.¹¹

The World Palace will contain, first of all, spacious halls capable of assembling large congresses, together with competently organised services which nowadays are necessary for temporary meetings of a great number of delegates.

From this point of view, the arrangements will be as complete as those provided on a temporary basis in the Congress Palaces of the great Universal Exhibitions: large assembly halls, general assembly rooms, committee rooms, places for the distribution of publications and correspondence, places for members of the press, and numerous others for postal, telephone and telegraph services, etc.

The fact that in one city of the world there will exist premises always ready to receive great international meetings, and organised in such a manner as to diminish as much as possible the expenses such assemblies entail, will have as a consequence an increase in the number of these meetings which will become more regular and frequent.¹²

Naturally, there is no question of opposing the trend towards associations holding their own assemblies in different parts of the world, thus spreading their ideas in every country. But the time has come to complete this kind of itinerant organisation by creating a centre which is ever ready to receive the associations when financial or diplomatic difficulties arise elsewhere and which also offers easy access from different countries for the frequent meetings of special commissions.

In the Palace there will be premises for the Executive Committees of the Associations and for their Secretaries' Offices as well as for the Executive Committee of the Union itself. The affiliated Associations will be able to establish at the Palace not only their Permanent Head Office but also to organise special institutes and laboratories for research.

A great number of these services are already in existence and new ones will certainly be created when facilities are offered. The Union's offices will be installed there, as will the services it will organise for the Associations, such as handling and forwarding, copying and printing, photographing and illustrating¹³, the provision of a central deposit for publications and the necessary rooms for collective publishing services.

The fact of actually assembling in one and the same building a great number of organisations will allow each of them to profit by a reduction in the cost of a whole series of general services which would be impossible for them to undertake separately for their individual use. They may utilize premises, collections, appliances and a staff placed at their disposal at very little cost, by paying a proportional part of the expenses.

On the other hand, the mutual aid the different organisations will be able to render each other will be greatly increased by doing away with correspondence which often requires long delays between enquiry and reply. The presence of persons on the spot, study facilities, and the furtherance of the means of action will mean considerable aid in scientific and administrative work.

The International Associations will be invited to establish their headquarters at the International Centre, but naturally those among them who have their Head Offices elsewhere may be represented at the Centre by establishing an agency or branch. They will thus be able to utilize all or some of the advantages offered by the Centre and, reciprocally, the Centre may benefit by their collaboration.

It is only by becoming sedentary and having a fixed domicile that Associations can really develop their services. Out of the 400 International Associations now existing, only 161 having established headquarters. Consequently there remain about 240 Associations yet to find a permanent location, apart from new International Associations which may be organised in the future.

VI. The Participation of the Governments in the World Centre

Governments are the constitutive elements of a world organisation. It is for the benefit of the peoples who comprise the nations that Governments are established. At the present time, when all the trends of technical progress bring men closer to one another and create not only a material but also a moral international interdependence, it is the first duty of Governments to take part in such a movement.

It is in the greatest interest of all nations to be known as they are, to show how they can contribute to general progress, to indicate the services which they can render to other nations and which other nations can render them. Until the present, such knowledge has been scattered in pamphlets and articles. Nowhere has it been possible to have a clear view of the conditions, needs, or riches of the countries of the world. The forging of international relations has been the result of accidental circumstances, not of scientific and permanent enquiry.

The Union of International Associations has fully realized this lack, and each of its federated groups is trying in the different domains of activity and research to discover and to recommend what is best for the general welfare of men. But their efforts often fail because they do not possess an accurate idea of the conditions existing in the various countries. Therefore the Central Office of the Union has divided its services into sections by countries (national sections), and by subjects (comparative sections). Both, as can be seen from the explanations given above, should be equally important to the Governments, and no stronger argument would seem necessary to prove how much in their interest is participation in the vast work of coordination and cooperation undertaken by the Union of International Associations.

The various Governments are requested: 1) to give their support to a section devoted to their country and organised at the International Centre; 2) to be permanently represented by at least one delegate at the Union and especially at its triennial Congresses; 3) to help the Union by providing an adequate subsidy; 4) to co-operate in the formation of the international collections: a) of the International Museum by sending exhibits suitable for forming a permanent national section like the official sections established temporarily at universal exhibitions; b) of the International Library by sending all the official publications issued since 1900 by the various governmental authorities or prepared under their auspices;

c) of the Universal Bibliographic Repertory by sending all the catalogues concerning works published in their countries or possessed by their leading libraries.¹⁴

TABLES AND DIAGRAMS¹⁵

1. History

- 1895. Foundation of the International Institute of Bibliography.
- 1906. Preliminary meeting for the creation of a Central Office of International Associations.
- 1907. Foundation of the International Library.
- 1909. *Annuaire de la vie internationale* published by the Central Office.
- 1910. First session of the World Congress of International Associations.
- 1912. The Review, *La Vie internationale*, published as official organ of the Union.
- 1913. Second session of the World Congress of International Associations.

2. Internationalization of Modern Life

A. MATERIAL LIFE.

<i>Relations</i>	Emigration. Travel. Unification of railways, telegraph, radiotelegraph.
<i>Nutrition</i>	Use of food products coming from all parts of the world.
<i>Generation</i>	International marriages.
<i>Health</i>	International measures against cholera, yellow fever, plague, tuberculosis, etc.

B. ECONOMIC LIFE.

<i>Production</i>	Division of labour. International trusts. Foreign workmen.
<i>Circulation</i>	International capital and banking. Foreign shares.

C. INTELLECTUAL LIFE.

<i>Technics</i>	International organisation of research. Congresses, institutes. Systems of weights and measures. International inventions.
<i>Art, Literature</i>	Their international influence and protection. Libraries becoming international.
<i>Education</i>	Unification of programmes. Equivalence of diplomas. Exchange of professors and students.
<i>Creeds. Morality</i>	Universal religions. Universal morality

D. POLITICAL AND JURIDICAL LIFE

<i>Organisation of the powers</i>	International Parliament (Peace Conferences, special diplomatic conferences). International Justice (Court of Arbitration, Court of Prizes). International administration (Public collective services).
<i>Law</i>	Public international law. Private international law: marriage, guardianship, inheritance, bills of exchange, artistic and literary property, patents, maritime navigation, extradition, etc.

3. *World Centre*

founded in 1910 by the Union of International Associations to develop the Organisation of International Life

A. ORGANS.

1. World Congresses (Representative organ).
2. Central Office (Executive organ).
3. National Centres of Internationalism (Local branches).

B. WORKS.

1. Cooperation between the International Associations.
2. Contribution to special international legislation.
3. Coordination of systems of units.
4. Systematic organisation of International Associations.
5. Synthetic and coordinated publications. Information. Education.
6. Terminology and international language.

C. COLLECTIONS.

1. International Museum.
2. International Library.
3. Documentary and Encyclopedic Archives.
4. Universal Bibliographic Catalogue.

D. PUBLICATIONS.

1. Review, *La Vie internationale*.
3. General Code of Resolutions of International Congresses.
4. Acts of the World Congress.

E. DIFFUSION

1. Central University and Centre for Comparative Studies.
2. Circulating University.
3. International Information Bureau.

F. COOPERATIVE SERVICES.

1. Bureaux for International Associations.
2. Cooperative bookselling and publishing services.

4. Statistics

ORGANISATION

International organisations affiliated (1913)	169
Governments represented at the World Congress (1913)	22

PUBLICATIONS

Review <i>La Vie internationale</i> (1912, 1913).	
Number of pages	2.478
Yearbook <i>Annuaire de la vie internationale</i> (1908-1909; 1910-1911). Number of pages	4.202
World Congress Transactions: <i>Actes du Congrès mondial</i> (1910)	
Number of pages	1.246
Number of reports	60
World Congress Transactions: <i>Actes du Congrès mondial</i> (1913)	
Number of pages	1.600
Number of reports	80
General Codification of resolutions of the International Associations (<i>in preparation</i>).	
Number of pages	140
Classification: <i>Manuel du Répertoire Bibliographique Universel</i> . Including the 35,000 headings of the Decimal classification. Number of pages.	2.250
<i>Bibliographia Universalis</i> . ¹⁶	
Number of contributions	122
Number of printed notices (1913)	1.293.652

COLLECTIONS

International Museum:	
Number of objects	12.000
Number of visitors (1913)	12.904
International Library:	
Number of deposited libraries	62
Number of volumes	75.000
Universal Bibliographic Catalogue:	
Number of cards	11.000.000
Number of consultancies (1913)	1.790
Documentary Cyclopedical Archives:	
Number of files	10.000
Number of pieces	300.000

Editor's Notes

1. *The Union of International Associations: A World Centre* (Publication No. 60; Bruxelles: Union des Associations Internationales Office Central, 1914.) This unsigned English publication has been edited in an attempt to make its language correct, clearer, and more natural than as it now stands. It should be attributed to both Otlet and La Fontaine.
2. The text is followed at this point by a table of contents, "Sommary" [sic], for the numbered sections or chapters that make up the rest of the pamphlet. It is omitted here.
3. This publication was in fact begun by Alfred Fried and had been published by the International Institute of Peace at Monaco since 1905. The fourth volume, for 1908-09, was jointly edited by Fried, Otlet and La Fontaine. It was issued in 1909, not 1910, by the Office Central des Associations Internationales in Brussels. At 1500 pages, it was about 5 times the size of Fried's more modest compilation. The next volume bears the imprint date 1911, not 1912. The Belgian Sociological Society undertook a major survey of the international associations, drawing up a lengthy questionnaire for the purpose. It was the formidable results of this that led to the expansion of the *Annuaire* and the collection of much more information about each of the associations than had been held earlier. This work was co-ordinated by Cyrille Van Overbergh, President of the Society and Director General of Higher Education in the Ministry of the Sciences and Arts. He acted for a time as one of the Secretaries General of the UIA.
4. The text uses the word "monographs" not "entries" here and in the following sentence.
5. This was a first cut at what became known as the *Code des voeux*. It appeared in the proceedings of the first World Congress of the International Association (*Actes: Documents préliminaires, rapports, procès-verbaux, code*. Congrès Mondial des Associations Internationales, Premier Session, 1910. Publication No. 2a; Bruxelles: Union des Associations Internationales, 1913). The Second World Congress, held in Ghent and Brussels in 1913, formally recommended the preparation of a complete *Code des voeux*. After the war, in 1920, the League of Nations granted the UIA a subsidy of £1500 to publish the work. It was in fact never finished. Compiled eventually by Henri La Fontaine, a first volume, over 900 pages in length, appeared in 1923, but no more was published.
6. The text uses the phrase "didactic and intuitive demonstration".
7. These museums had their origin in special exhibitions associated with conferences at the 1910 International Exhibition of Brussels. The Catalogue of the Musée Administratif International was issued as publication No. 2 of the International Museum. The International Museum of Roads also had a separate catalogue: *Notice et catalogue sommaire du Musée international de la route organisé par le Congrès de la route*. This was publication no. 9 of the International Museum. Other sections having separate catalogues were Esperanto and Education.
8. The International Institute of Photography was set up in 1905. Ernest de Potter, editor of the *Revue belge de photographie*, undertook to donate his collections to the new Institute

and to serve as "Conservator of the Photographic Division of the International Institute of Bibliography." Primarily the Institute was to organise a Universal Iconographic Repertory which was described as "a general collection of pictures and documentary illustrations originating from various sources on all subjects and classified." (*La Documentation et l' iconographie*. IIB Publication No. 78; Bruxelles: 1906, p.8). This grew steadily and in a general report on the IIB in 1912 its secretary, Masure, estimated that it had well over a quarter of a million entries.

9. The Newspaper Museum, Musée de la Presse, had been set up in 1907 in the IIB as a cooperative venture with the Union de la Presse Périodique Belge of which Otlet was then Vice-President (President from 1908 until 1923) and the Cercle des Collectionneurs des Journaux. The new Museum was the beneficiary of two major newspaper collections: that of André Warzée which had been left to the Union de la Presse Périodique Belge and that of Jan Van der Broeck who had been active in setting up the Museum. The Museum grew apace and a Curator, Albert de Fonvert was appointed at some time before 1911 (*Le Musée international de la presse: section de l'Institut International de Bibliographie. Notice catalogue*. IIB Publication No. 108; Bruxelles: IIB, 1918).
10. The text uses the phrase, "... is not only an attracting center ... "
11. The major description of the Palais Mondial or World Palace on that occasion is given in "*Le Centre International et le Palais Mondial*", Congrès mondial des Associations internationales, Bruxelles, 1913 [*Actes*:] première partie - introduction, documents préliminaire, liste des adhérents, rapports; second partie - procès-verbaux des séances; troisième partie - résolutions, réceptions et visites, tables. Publication No. 46; Bruxelles: UIA, 1914, pp. 1-15. The resolutions referred to are given in: "*L'Union des Associations Internationales et le Centre International*", *ibid.*, pp. 1178-1182.
12. The text has "periodical"
13. The text has "drawing".
14. Section VII of the pamphlet, which follows at this point, "Governments and International Associations represented to [sic] the World Congress, 1913", is simply a long list and is omitted here.
15. This pamphlet is completed by 14 unnumbered leaves of tables, diagrams and plates of photographs of the International Centre. The first photograph is of the Palais du Cinquantenaire, built in 1880 as part of the celebrations for Belgium's 50th anniversary as an independent state. The caption describes it as the "present seat of the International Museum", though the UIA had, only been given use of part of one wing. Another leaf shows small snapshots of the "Political and Juridical Sections" of the Museum, "Technical Section, Aviation Laboratory", and "The Spanish Section". These suggest the presence of professionally prepared graphics but few other exhibits. The Aviation Laboratory appears to have had eight or so small models of aeroplanes suspended from the ceiling over a large bordered circular surface (a landing field: a magnifying glass shows a tiny model plane on it) on a yet larger square table. Other plates have sketches or photographs of the Library, the Bibliography and the "Documentary and Encyclopedical Archives". The final plate contains the reproduction of a design for the projected - and grandiose - World Palace that would be built "for the Housing of the

World Centre and of Seats of the International Associations, Congresses and Assemblies - Museum - Library - University". An extremely wide, elaborately colonnaded front is surmounted by a dome. Two tall thin towers at some distance on either side, punctuate the expanse at the points where, extending beyond them to complete the facade, the building's wings begin.

The following tables and diagrams are omitted here: "Progressiv [sic] Extension of Social Structures", "Relations between the Organisms", "Statistics of International Assemblées [sic] (Congresses and Conventions)", Aim and Action of the World Centre and "The World Center[sic]". The last is a diagram showing levels or organisation in relation to broad subject areas. The order of the tables included has been changed.

16. "Contributions" to the *Bibliographia Universalis* were of two kinds: separate one-off bibliographies (such as, for example, Charles Sury's *Bibliographie féminine belge* and La Fontaine's *Bibliographie de la Paix*) or periodically published indexing or abstracting services. "Contributions" were so designated if they followed methods of compilation recommended by the IIB, especially inclusion in the entries of, or arrangement of entries by, a UDC number thus permitting direct incorporation of the entries into the Universal Bibliographic Repertory. Some of the periodical bibliographies grew out of, or were influenced by, Otlet and La Fontaine's proselytizing for the Repertory and sometimes adopted a common Latin form of name either as title or sub-title: *Bibliographia Zoologica*, *Bibliographia Geologica* and *Bibliographia Philosophica*, for example. Some were actually compiled under the auspices of the OIB, though published elsewhere, such as the *Bibliographia Economica Universalis* or the "Bulletin des sommaires", the monthly index of Belgian periodicals that was issued as part of the *Bibliographie de Belgique*.

10. NOTE FOR M. DURAND, PREFECT OF POLICE¹

Paris, 21 December 1915

Explanation

I have not come to Paris to make propaganda for peace. But like all thoughtful, reflective men I am completely preoccupied with the origins, the development and the objectives of this war and with what should follow it. I have devoted myself to the sometimes contradictory study of these matters in order to find some objective basis for them, a procedure which is required for the solution to any problem examined in a scholarly way. Thus I have had conversations here with some of the important figures in the world of science and politics who are long-standing acquaintances for the most part, and I have given a five-part course at the Ecole des Hautes Etudes Sociales: "After the War: Origins, Causes, Problem and Solution." I had taught here on two different occasions before the War, and the presentation of the above course was requested by the School's Administration rather than being pressed on them by me.

For twenty years the study of international matters has been one of my concerns. In Brussels, with the patronage and concrete support of the Belgian government, I founded the Union of International Associations, which has attempted to concentrate and coordinate the international movement of which Belgium had spontaneously become the headquarters fifty years ago. I am one of the organisers of the great congresses of this Union. I administer its offices and its publications as well as its Museum which is installed in government buildings.

This is to say that I am an internationalist. I add that I am not a pacifist. The distinction, which is not always made, is real. At the same time as the means of communication are making the world smaller and smaller, its population is increasing enormously. The natural result is that it is impossible to keep everyone confined to his own territory. International relations are being created and are proliferating; a world life is being revealed in every arena. There is a two-fold result: on the one hand common interests are established across political frontiers, everyone being more or less engaged in the immense circulation of men, products and ideas; on the other hand, antagonisms increase with the points of contact, and the possible areas of friction multiply. Governments in general have not been sufficiently attentive to this profound transformation. The consequence has been that all of this international life, at once so fertile and so dangerous, has been left pretty much to itself rather than being channelled into institutions that would organise it and establish necessary checks and balances. This is why it is necessary to search out the deep-seated cause not of this war - there have always been wars - but of the universal character of this war, of the terrible way in which

it has been conducted, of the involvement in it, either directly or indirectly, of all the civilian elements of the population.

The Pacifist wishes for peace at any price. This sentiment deludes him about human goodness and does not encourage rational thinking about sociological causes. He is like the charitable man who gives at once without bothering to find out if his alms will bring effective help. It is this, though, that concerns practical men and politicians who desire social reforms that can reduce suffering at its source.

The internationalist waits for a lasting peace and for a better organisation of the relationships between people which should be its natural fruit. Peace at any price, peace without justice, peace today without surety of its lasting tomorrow holds no interest for him.

Such different points of view result in quite different practical consequences. The evil which must be guarded against is international insecurity, an evil which made its ravages felt long before the War in that the armed peace, with its continual alerts, was no more than latent war and permitted nothing stable to be created. Internationalists believe that, in the future, security must be sought in the organisation of a Society of Nations in the same way in which a national society is organised. It should have a single authority that decides what must be done in this area; a judiciary to which all conflicts are compulsorily submitted, and an executive body with the power of sanctions, moral and economic in the first stages, military subsequently (an international allied army).² But The League of Nations should be founded in Liberty and Equality and should repudiate all hegemony, all domination by one state of others. It is directly opposed, therefore, to the German conception of Universal Empire or of a Confederation of Europe under the control of Prussia. This is why we must continue to fight "until victory" (Briand.).³ But clearly we must understand what the outcome must be, that is, a victory in which "the public law of Europe" triumphs (King George), which will overthrow all those "who preferred War to negotiation" (The same), which will result in "Freedom for the nations" (French and English ministers) and which will cause "Civilisation to triumph over barbarism" (all the French, all the English, all the Belgians).

I have sojourned for several months in Holland and Switzerland looking up old friends with whom I used to work. I was able to ascertain the real state of mind of highly placed neutrals and observed how inadequate was our propaganda to our allies. The latest official slogans, which I have just repeated, simple not very specific war cries, are not able by themselves to elicit the interest of the neutrals.⁴ Such persons do not themselves live in that climate of tension that surrounds us. This war is not their war and they take a more "panoramic" view of the situation than we. In their eyes the Allies do not form the bloc they do for us. Of France, which has always fought for liberty and progress, they are certain - of Belgium, too, on the same grounds. In England's case they have reservations. The Boer war is not forgotten, nor the methods of conquest that have prevailed in former times in England, the mistress of the seas and of her dominions. As for Russia, the neutrals are not only sceptical, they are indignant at the Galician incidents and, in the face of the German invasion, at the scorched earth policy to which whole nations are sacrificed.⁵ These recent affirmations of an autocratic mysticism are hardly of a kind to engender world enthusiasm. Precisely because we form a coalition, we should champion our cause before the neutrals with special arguments rather than waiting for results, or for

the isolated official declarations given above which are only useful for internal consumption.

In fact, the neutrals can be useful in three ways: morally, economically and militarily. There are three levels of support, and to hope for what is so often impossible, military support, we risk losing the other two kinds, which, already important today, will become supremely so tomorrow. Now, what concerns the neutrals is really not so much the war itself as what is to follow it; that is, the war's objectives and future plans for Europe and therefore the world. If we, the allies, had said very clearly and precisely what our programme was instead of being tied to generalities, if we had included the neutrals in this programme, our position with respect to them would have been much stronger. Instead of this, we have announced to anyone willing to listen that, at the conclusion of the war, the neutrals will be treated as negligible quantities. Our Press, speaking out beyond its bounds, has declared that "no one today has the right either by formal agreements or by hidden disclaimers, to establish the political outcomes that allied military effort will achieve. Peace will be whatever is won by the bravery of our soldiers, and it would be a serious fault to lay down conditions about it beforehand in the heat of the passions of the moment rather than according to the requirements of an actual situation which cannot yet be known clearly" (*Le Temps*). Reading this, the neutrals infer that the Allies will in no way be content to restore violated rights, to chastise the German aggressor, to make it impossible for him to do harm in the future, but rather that they hope to gain the maximum profit for themselves from their victory - in other words, to continue the old political game. Thus we do not have the means of making the neutrals understand in a way that they can accept, what the differences will be in their situation after our victory as compared with that of our enemies. This would not be so if they could see the place and role reserved for them in a well-organised League of Nations.

Such are the serious gaps in what we are doing abroad (America)⁶ and with respect to the Western European neutrals, to say nothing about what has earned us setbacks in the Balkans,⁷ namely, a policy insufficiently illuminated by "principles" (the principle of nations threatened by Italo-Serbian rivalry,⁸ the principle of freedom of the seas threatened by the Russian proposal to occupy Constantinople⁹).

The events of the war have therefore confirmed me in my internationalist opinions. They provide me with an explanation for the war; they make me understand the noble objective that we must hold in our minds; they allow me to see clearly what are the motives of the neutrals towards us.

These opinions are also in profound agreement with my patriotic faith, for the interests of Belgium are linked to the final triumph of these principles. For its liberty, for the honour of its given word, for rights transgressed, my country has resigned itself to martyrdom (King Albert, his Ministers, all of the Belgians). For it my two sons, my only children, have gone out to battle. The youngest, who enlisted voluntarily with my consent, has been reported missing in the battle of the Yser.¹⁰ If this war does not end in the creation of a stable League of Nations, all of our sacrifices will have been in vain. And, if the fault is ours, our dead will renounce us. The League of Nations alone, representing justice and security organised and assured to all, can give a real meaning to the words that are our battle cries and which can do us harm only if it is possible to suspect equivocation in them. Even so, this new order, impossible if we do not win,

cannot be created by itself on the morrow of victory unless by study, discussion and explanation to leading groups, we have prepared the way for it first.

Believing that such preparatory work should be undertaken, without risk to anyone, by those who have given pledges of the depth of their attachment to their national cause and who continue to fight the enemy by the spoken word and by the pen, being too old to do otherwise, I have adopted such a course of action.

Editor's Notes

1. This is headed "Paul Otlet, Note remise à M. Durand Prefet de Police à Paris, le 21 Décembre 1915." Above this is a faint penciled note in Otlet's handwriting: "Note remise à Prêfet de Police, M. Durand?" This document was found in one of the baskets of the Otletaneum in the old Mundaneum, Parc Léopold.

Otlet was right to query the name of the Prefect of Police. In 1915, he was M.E. Laurent and seems to have had a reputation for a certain strictness compared with his successor who took office in 1917 (Abel Hermant, *La Vie à Paris: une année de guerre: 1917* pp. 139-141).

Otlet's internationalist activities during the War were not popular in certain quarters. He was attacked as a pacifist and traitor to the Allied cause both in the French press and by a number of Belgians in exile. At one stage he was refused entry to France, though this interdiction was soon lifted after an enquiry and the intervention of French friends and colleagues. In July 1916, Otlet made a vigorous statement against his detractors to the Geneva branch of the patriotic society, Belges Partout, Belges Toujours, the organisation of which he had instigated.

2. Otlet uses the term "Société des nations" and, in his *Problèmes Internationaux et la guerre* of 1916, explains that the use of the term to designate a supranational community was sanctioned in the resolutions of the 1907 Peace Conference at the Hague. In his view such a "society" would need moral and legal personality and political sovereignty. Based on a declaration of fundamental human rights, its functions would be divided between four powers and institutions; a legislative power exercised through a congress or parliament; a judicial power exercised through one or more courts; an executive power exercised by an International Diplomatic Council; and a police power exercised through an international army. (See Editor's Note 2 in the following paper, "The Organisation of a Society of Nations").

Given the interest developing world-wide by the time Otlet wrote to M.Laurent in what in English came to be known as The League of Nations (but which in French is Société des Nations), and Otlet's passionate espousal of it, at least initially, it seems best to translate the French name as League of Nations, save where the parallel of a national and international society is needed.

3. Aristide Briand, 1862-1932, was French foreign minister when war broke out. He headed an all-party government, known a the Union sacrée, from October 1915 to March 1917, but also continued to hold the Foreign Affairs portfolio.

4. The neutral European powers in the First World War were Switzerland, Holland, Spain and the Scandinavian countries. Greece did not formally enter The War until 1917; she did so on the side of the Entente or Allied powers. It was not until 1916 and then with increasing frequency that formal public statements of war aims were made by the political leaders of the various belligerent powers.
5. In April 1916 the German army launched a major attack on Russian positions in Galicia forcing the Russian army to retreat. Its Commander, Grand Duke Nicholas "resolved to effect the defense of Russia by repeating, at ten times the scale, the military tragedy of a hundred years before. The campaign of 1915 cost the Russian Empire 15 percent of its territories, 10 percent of its railways; 30 percent of its industries. Of its population 20 percent were dispersed or passed under Austro-German rule. The Russian army lost 2,400,000 men... the retreat was everywhere marked by devastation. Homesteads were razed, crops burned, cattle slaughtered. In the towns the public services, the power stations, the waterworks and the factories were demolished... And, as if the army's passage was not enough, the country was afflicted by an exodus of refugees. Some of them fled voluntarily... others were ejected by force. Whole communities, especially Jewish, were turned out of their holdings collectively." The numbers involved in the forced migrations have been estimated to be 10,000,000 of whom only a quarter survived (Frank P. Chambers, *The War Behind the War*, p.104).
6. America held aloof from the European War until 1917.
7. The Balkan States, still smouldering among themselves after the Balkan wars of 1912 and 1913, were neutral at the outbreak of War and were "an open field for diplomatic and counter-diplomatic by-play that was at once somewhat sordid and wanting in results" (Frank P. Chambers, *The War Behind the War*, p. 71).

In February 1915, Allied ships began the bombardment of the outer ports of the Turkish-held straits of the Dardanelles initiating the Gallipoli campaign. This devastating and unsuccessful encounter - a setback if ever there was one - ended 10 months later with the withdrawal of British, Imperial, and French troops.

There were other Balkan difficulties for the allies. In 1915 Rumania almost followed Italy into the War on the Allied side but held back until 1916. Montenegro having supported Serbia at the outbreak of War, submitted to Austria in 1915. Prime Minister Venizelos of Greece sanctioned a landing of Allied troops at Salonika to help Greece fulfil treaty obligations to Serbia. This action was repudiated by King Constantine of Greece, though the troops began to land in August 1915. Bulgaria mobilized on the side of the Central Powers in September 1915. In October the Austro-German forces, with Bulgarian help, invaded the Balkans to subdue Serbia. Greece stood by. Serbia was overtaken and King Constantine appealed to his brother-in-law, Kaiser Wilhelm of Germany, to stop further penetration into Macedonia.

8. Otlet's reference to Italy and Serbia is presumably to the provision of the agreement creating the Triple Alliance between Italy, Austro-Hungary and Germany that was in force at the outbreak of the war. According to one of these provisions, if either Italy or Austro-Hungary upset the *status quo* in the Balkans the other side could demand

recompense. With the outbreak of War, Italy invoked this provision and began haggling with Austria for territorial concessions, especially in the Italian-speaking areas of the Austro-Hungarian Empire and in Albania. At the same time, Italy was also vigorously being courted by the Allied Powers, and, following the secret Treaty of London in April 1915, she entered the War on the side of the Allies in May.

9. Russia had for centuries claimed Constantinople. A warm-water port, it gave access through the Sea of Marmara and the Dardanelles straits to the Aegean and Mediterranean seas. During 1914 and 1915, especially after the Dardanelles campaign began, Russian diplomacy actively pursued the goal of acquiring Constantinople and the Dardanelles straits. A direct request that they be given her was eventually agreed to in March 1915 by the Allies and a secret treaty to that effect was concluded between them and Russia.
10. In September 1914, Otlet's older son, Marcel, was taken prisoner at Antwerp and was eventually interned in Switzerland. In October, Jean (born 1894) was reported missing in The Battle of the Yser. Otlet himself is said to have searched the battlefield for the boy's body (*Lorphèvre, "Otlet, Paul" Biographie nationale*)

In a collection of speeches and articles from The War period, Henri Carton de Wiart, Belgian Minister of Justice in exile and, incidentally, colleague of Otlet's, described the importance of this battle in which so many had been lost:

"At the moment when we were gathered by the Yser, on the 11th October, the left wing of the French was still at La Brassee. Our infantry, to the number of 48,000, supported by 6,000 French Marine Fusiliers, had not had a moment's rest since the beginning of the campaign. Broken with fatigue, anxiety and lack of clothing, they seemed incapable of any further effort. First of all they were required to hold fast during 48 hours, unaided, upon a line of 40 kilometres, against the countless Germans who, from north and east, were moving against Calais. They stood their ground through fifteen days, in spite of their uniforms in rags, their failing limbs, their empty stomachs and in spite of the shells and the machine guns, the rain and the mud...." (Henri Carton de Wiart, *The Way of Honour*, p.68).

11. THE ORGANISATION OF THE SOCIETY OF NATIONS¹

An examination of the factors and conditions of the life of nations stimulates this general observation: as their national life has developed, nations have created an international life which has become more and more active, extensive, and varied.

Great social forces are at work outside national frontiers as well as inside them. Ethnic forces bring nationalities into conflict with the imperialist, oppressive, maiming, annexionist State. Economic forces have stirred up rivalries in food supply and trade outlets. Intellectual and moral forces have led to conflicts between languages, religions, customs, and particular ideologies. Political forces oppose, and have led to collisions with, the absolute sovereignty of States. These antagonisms which accumulate, merge and separate all at the same time, have given this titanic battle, the World War, its own unique character.

But while the nations fight each other in every territory, seeming to leave opportunity only for domination or destruction, new directions and developments have everywhere become apparent. It appears that national antagonisms can achieve some relative reconciliation in higher forms of life that are based on interdependence instead of isolation, cooperation instead of conflict, liberty instead of oppression and coercion, order and organisation instead of disorder and anarchy. The existence and rights of an orderly international life are now being stressed alongside of, and as a prolongation of, national life. Everywhere social structures are increasing in size, are being erected on the basis of a recognition of general ideals and interests that are common to all, that are truly universal and human. They are also based on the subordination to these general ideals and interests of those that are national, just as the latter necessitated the subordination of the particular interests of factions, parties, regions and localities.

The Society of Nations is the accepted term for designating this supernational community [1]. We must now examine its definitive creation, the culmination of efforts over a long period.

Until now [in this book, *International Problems and the War*], we have been on the solid ground of fact. We have been speaking above all of what is, and our task has been mainly one of analysis and exposition. We will now move to the shifting ground of concepts, for we must now speak of what will emerge in the near future or of what, rationally, ought to be. We offer simultaneously a synthesis and a proposed plan for considered, voluntary action. It is still possible to deal mostly in facts and to link tomorrow to today in some fashion. All that is necessary is to show that the proposed reforms have their point of departure in preliminary existing organisations. Doubtless these represent timid and isolated initiatives, but it will be useful and possible to develop,

[1] This expression has been sanctioned by the 1907 Hague Conference in its final resolution.²

improve, and coordinate them. All the same, it is not a matter of proposing a programme that must be carried out immediately. What is needed is to show with some exactness the direction in which events and the more elevated aspirations of our times have been evolving.

We must limit ourselves, especially after what we have previously discussed, to a simple outline filled in here and there. This outline will be confined to the organisation of international public life leaving aside all that deals with private or corporate life. Of course these two kinds of life complete, sustain, and interpenetrate each other. But, ignoring the fact that international relations between individuals and associations have already largely been organised, as we have seen, it is the relations between States which now urgently need to be stabilised and organised [2].

A General Conceptualisation of the Society of Nations

1. *Proposed Organisation.* The organisation proposed may be defined in the following manner: (1) the establishment between the States of a juridical union based on the autonomy and independence of each; (2) the institution above them of a super-national authority endowed with moral and legal personality and political sovereignty. The jurisdiction of this super-national authority to extend to the great world interests with the two-fold object of, a) on the one hand preventing anything that might harm them, especially international insecurity, and b) on the other hand encouraging what would be useful to them; (3) a positive and detailed declaration of fundamental rights, internationally guaranteed, of individuals, associations, nationalities, and States, all considered as persons and members of the human community.

The functions attributed to the super-national authority would be divided between four great organs or institutions; (1) a Legislative Power - a Congress or Parliament - composed of delegates from the National Parliaments in which the great economic and intellectual interests and functions incorporated in International Unions would also be represented; (2) a Judicial Power, exercising the functions of mediation, arbitration, judgment, and conciliation. To this Judicial Power all the States would be party, and recourse to it would be obligatory, its decisions being supported by effective sanctions; (3) an Executive Power exercised by an International Diplomatic Council authorised to direct and administer world interests within the limits of the law and world justice, having for this purpose administrative and financial resources and the necessary powers of sanction; and finally, (4) a Sanctioning Power, an international army formed from contingents provided by the national armies and directed by a central general staff. The goal of its operations would be to impose on opponents by lawful force the judgements promulgated by the International Council.

[2] Because a draft can only achieve the necessary precision if its text is concrete and capable of being transformed into resolutions, laws and treaties, we have presented a draft world constitution intended to promote preliminary discussions and counter proposals in our book *Fin de la guerre*. During the War, with the cooperation of the Union of International Associations among others, the Organisation Centrale Pour Une Paix Durable [Central Organisation for a Durable Peace] was set up in the Hague and in Berne. Dealing only with research, but directing this towards immediately practical goals, it has entrusted to "National-General" and "International-Special" commissions the preparation of reports, accompanied by preliminary drafts of world conventions, on the nine points of a minimum programme which in fact bears on the foundations of the "Society of Nations." This organisation's work, which we believed that we must support personally, has been developed very energetically.³

This super-national authority would act throughout the whole world. On the one hand, in territories belonging to the States, it would act indirectly through them or through a special organisation as intermediary. On the other hand, it would act directly in the case of the seas, the air, and certain territories declared to lie in the international domain. The organisation thus defined will be set down in a World-Charter, a higher constitution that would take precedence over all national constitutions. This Charter would be promulgated by a great Congress of all the Powers assembled immediately at the close of the war after the settlement of issues specific to the Belligerents, a Congress which would sit as a true Constituent Assembly for the world.

2. Possible Systems of International Politics. Hitherto the world has known only three international political systems, three principles controlling the relations between States: hegemony, equilibrium, and the Christian system of the Middle Ages. The last implied a moral order founded upon religious authority - the Popes theoretically holding the balance. But the Reformation weakened the Papacy, while moral authority, because of the work of jurists and theoreticians of national law, grew increasingly important and the modern State was formed. This system disappeared at the Peace of Westphalia, which recognised the Protestant States.⁴

Hegemony, the preponderance of one individual, leads in its extreme form to universal Empire. This policy, practised in modern times by the Hapsburgs, the House of Spain and the France of Louis XIV and Napoleon, has always collapsed in ruins. This ancient dream of domination has haunted Germany in its turn, and now we have the War, still unfinished, that already suggests the fate reserved for her by the nations united to resist her.

With regard to equilibrium, this consists in establishing a balance between the powers and in forming combinations which act in counterbalance. The corollary of this policy is a system of alliances, compensations, and also "tips". It has twice found an expression that at the time was thought perfect - in the treaties of Westphalia and Vienna.⁵ But with the introduction into world life of a large number of new States and with the rapid growth of certain of the elements making up the States, such as population, commerce and education, achieving equilibrium is a "puzzle" (*sic*). The least disturbance upsets the whole system. The proposed new system, the Society of Nations or the Union of States, on a basis of equality and independence provides for States what civil society provides for individuals. Rights in it are equal and guaranteed to all, whether strong or weak, rich or poor.

3. The Union is Federative. The proposed organisation represents the extension to all the States of a true federation involving a minimum tie. Thus it will be the culmination of the federative trend and the trend towards alliances. Special agreements and groupings between various States will be able to continue to exist provided that they did not run counter to the principles of the Union.

4. The Union is Juridical. The Union can only exist as a juridical system. The Society of Nations is above all else a society based upon law, implying rights and related obligations of as precise and obligatory a nature as those which derive from the society of individuals in a civilized State. The existence of such a society involving the States has been officially recognized at the two Hague Conferences without measures having been taken to ensure that it functioned properly.⁶

5. *The Union is World Wide.* The Union must extend to all the States equally, and to all their possessions, colonies, and protectorates. To limit it to certain States would be to fail in obtaining the desired objectives. The United States and Japan, although American and Asiatic States, have been recognized as great Powers. Previously Turkey, though a non-Christian State, had been accepted as part of the European Concert. To wish to create a Union of European States (United States of Europe) is to misunderstand the real state of world relations in which the interests existing between the Americas and certain countries of Western Europe are far greater than the interests that exist between these countries and those of Southern or Eastern Europe. The great problems of the future will be extra-European, those in which North and South America and Japan will be concerned. At the present time Japan is already one of the Belligerents, and the United States finds it difficult to keep out of the struggle. Almost all the States were represented at the second Hague Conference.

6. *The Union Limits Sovereignty.* The Union implies surrender of certain extreme rights that the States claim with regard to one another. It limits their sovereignty. The States must choose either to keep their absolute sovereignty and expose themselves to death-struggles with all the consequences these struggles imply in modern war, or to renounce the absoluteness of this sovereignty and accept the honourable but secure settlement of a world-wide pact. In fact, in the present political situation, the choice is yet more circumscribed since it is simply a question of renouncing the special alliances which for a long time have already limited the sovereignty of almost all the Great Powers, that is of renouncing a precarious and unstable alliance with some in favour of a permanent and stable alliance with all. Interdependence and solidarity lie at the foundation of the life of States. All the Union does is to secure recognition of these conditions, to organise them, and to derive from them all their positive consequences.

7. *The Union is Practical.* The Society of Nations is not "Utopian," for it is conceived in the image of the most advanced national societies. It has a purpose, members (a population), organs, a sphere of action (territories). It therefore makes no innovation on these points but continues and extends what already exists following the fundamental idea that international relations are only the extension beyond frontiers of national relations. The advent of the Society of Nations thus falls into line with general sociological evolution which reveals the successive appearance of increasingly large structures embracing first the City, then the County and the Duchy, then the State. There is nothing to suggest that this latest stage should be considered as final. On the contrary, the possibility of an organised community involving higher national and human interests is now being explored by the best minds.

8. *The Union Must be Created as a Whole.* The establishment at one and the same time of international institutions forming a complete system also follows precedents, which, though less far-reaching than the work now to be done, nonetheless provide convincing evidence. In our modern societies institutions no longer arise from immemorial usage, slowly developing in unknown directions. Almost all the States possess a written Constitution, which was the work of sensitive and thoughtful minds before becoming the compulsory law of a whole people. These Constitutions created a system of necessary institutions in one piece without waiting for them to emerge of their own accord following who knows what pre-existing harmony between unconscious individual actions. The four fundamental institutions proposed - the legislature, the

judiciary, the executive, and the armed forces - are those which have always been produced by the organising action of societies. To want for simplicity's sake, to be limited to a single authoritative institution possessing all of these powers is to invite inevitable confusion. It would lose the advantages of an appropriate division of functions and would result in having to do in several stages what is the necessary consequence of a first step in this direction. The explicit is always better than the implicit.

9. *The Union, Supernational Authority.* The union of all the States into an organised League of Nations would certainly not put an end to struggles and conflicts. They are the very essence of life itself. But they would be transformed, as internal conflicts have been. A super-national authority, a visible and effective representation of what is common and best in all States, will be more than a simple cumulation of national authorities, in the same way that a State is more than an association of townships. There is a difference of degree, almost of nature. In the disorder of the Middle Ages and the first years of the modern period when the feudatories and petty princes knew no other way of life than war and exploitation of the weakness of those beneath them, there emerged the national authority of the King and Emperor. Present circumstances being analogous, a super-national authority must now appear.

10. *The Union Cannot be Avoided.* Can an international order be set up in one, two, or several stages? No one can say because of the extreme complexity of the circumstances. There is little doubt, however, that the direction of events tends towards the first outcome which will lead to enormous economy of social effort, will prevent new wars and revolutions as well as taking advantage of the present general dislocation in order to achieve a single radical solution.

Different, less complete, and less radical proposals have been put forward. Certain people think that a *régime* of opinion supported by Parliamentary control in each country would give sufficient moral authority to political agreements for governments to respect them in the way that individuals respect their own engagements. Others consider that the world Concert of the Great Powers, as the latest organisation that the Society of Nations had created before the war, should be taken as the basis of any reorganisation. Consequently they propose to reinforce the eight Great Powers with four smaller ones, chosen freely by their peers, and to consider that the body of twelve thus formed represents closely enough not only the wisdom and judgment but also the power of the civilized world. This body would have the right to call on its own forces and on those of all the others as an international police force [3]. Yet others believe that a League of Peace, which they have not yet defined in detail, will do for all present needs [4].

All of these schemes agree in recognising that a new function has arisen - that of securing peace - and that consequently, by virtue of the division of social labour, a new organ must be created. This organ can only be a supernational authority

[3] J. Lawrence, *The Peaceful Settlement of International Disputes*. "It is necessary never to lose sight of the fact that the origin and centre of all absolute governments lies in an executive power that absorbs into itself the entire legislative and judicial powers. These are detached from it only slowly and incompletely. The Executive in all countries remains the centre of the customs and traditions of the old régime and has a natural tendency to defend its absolutist prerogative. To leave the conduct of international affairs to an executive power will allow them fatally to be conducted by it like the absolutism of the States."

[4] A number of people have anticipated an immediate federation of allies in which there will be a place for the neutral countries and a place reserved for enemies at such time as they adopt its principles.

approximating more or less to the model for which we present a few details in the following pages [omitted here] [5].

The Future Congress. The International Constituent.

1. It is easy to imagine that at the close of hostilities there will be various ideas about how the consequences of the present war will have to be dealt with.

(a) the war will end without a Congress. That is to say, the conquerors will impose their conditions on the conquered without discussion, issues of concern being adjusted among themselves diplomatically.

(b) there will be a Congress of the belligerent powers from which, however, the neutrals will be excluded, to settle the questions raised by the war.

(c) a Congress will be held by the belligerents only, who, having decided their own terms of settlement, will then summon a third Hague Conference to deal with questions affecting all the nations.

(d) there will be a Congress of both belligerents and neutrals sitting as an international Constitutional Convention which will give a rational organisation to the League of Nations by promulgating a World-Charter.

2. Of all these ideas, that of the Constitutional Convention is the most rational for these reasons:

(a) It is necessary that all the States should take part in the meetings that are to regulate the fate of Europe and of the world and to consider how a repetition of the present disaster can be avoided. Neutrals are as much interested as belligerents in the solution of the numerous economic, ethnic, juridical, and political matters that have to be settled. Not having experienced all the passions of war, the neutrals - especially those far distant from the theatre of operations - have fewer pre-conceived ideas on many issues and are more likely to take into account the general interests of Humanity.

(b) An objection: "the neutrals have shown their weakness or indifference by not taking part in the struggle. Even after the violation of Belgian neutrality and the clear violations of the Conventions of 1907,⁸ they had continued to maintain relations with Germany and Austro-Hungary. They would not have, therefore, any authority to enforce the clauses of any treaty that they would draw up". This objection loses its force in the face of the arguments stated above. The composition of the Congress clearly depends on what has to be done at it. An international juridical order cannot be created without the participation of all of the States and their acceptance of the decisions relative to it. After all, the neutrals have suffered very considerably from the war, and they too are in the necessary frame of mind to achieve serious reforms.

(c) Large general Congresses have been held at all the great periods of modern history. There were the Congresses of Westphalia in 1648, that of Vienna in 1815 (where there were as many as 216 heads of mission),⁹ those of Paris in 1856,¹⁰ Berlin in 1878,¹¹ Berlin again in 1884 (about Africa),¹² Algeciras (about Morocco),¹³ to say nothing of the Hague Conferences of 1899 and 1907.¹⁴

[5] Bibliography Related to the Union of States[has been removed to form Appendix 1 of this paper; only an excerpt of it given]⁷

(d) It will be necessary, moreover, when peace comes to settle many individual matters with the neutrals. With Greece, the consequences of its occupation;¹⁵ with Holland, the status of the governance of the Scheldt;¹⁶ with Switzerland, the abolition of the neutral zone of Savoy and free access to the sea;¹⁷ with China, the recent convention imposed upon her by Japan;¹⁸ with the United States, joined with the Southern Republics in a Pan-American Union, the regulation of the sea and of war at sea.¹⁹

(e) If it is objected that there will be no time to consider the problems of a World Charter when peace is declared, we would reply that the preliminaries of peace must be distinguished from the peace-treaty itself, and the work of the Belligerents from that of the general Congress. The deliberations concerning the Peace of Westphalia, the Peace of Vienna, and the Peace of Paris lasted for months. The peace of Frankfurt was only finalised 120 days after the armistice.²⁰

(f) Even in the absence of a treaty, the agreements of the Belligerents will have to deal with fundamental issues of every kind. Would it be too much to ask that they be expressed explicitly and fully. Moreover, how can one claim that it would be easier to settle peace by individual rather than general arrangements when eight belligerents are involved on one side and four on the other, who because of their possessions and influence, comprise almost all the major nations of the old continent.²¹ Because of this surely the result would be a Charter in fact. If certain points have to be negotiated in addition with neutrals, would this not necessarily lead to a whole as complicated as, but less clear than, a World Charter?

(g) A large Congress could very well act in sections or hold special meetings concurrently with general meetings. This was the case at Münster and Osnabrück (Treaty of Westphalia). So again in 1815. Distinctions could be made between military and special territorial matters affecting the Belligerents only; special questions concerning particular neutrals and particular Belligerents; matters concerning the neutrals themselves; and the major subjects of general organisation.

3. A general Congress is therefore essential. The views expressed in the course of this work suggest how important from the outset is a suitable composition of delegates. The system recommended and the suggestions made for the composition of an International Parliament could - with various modifications - be applied to the composition of the Constituent Assembly. But it is especially important that the spirit of diplomacy should not rule supreme. Politicians, jurists, scholars and business men must also introduce their points of view. The nationalities whose fate is being decided must be able to make their voices heard, and the great international associations must be represented at least as observers.

During the whole of the Congress's sittings, the National Parliaments must control, support and direct the work of their national delegates. In the city where the meetings are to be held, the organised forces of international public opinion should have permanent representation and hold meetings and discussions. For the Congress, far from working in an atmosphere of isolation must, on the contrary, feel churning around it all the great passions, all the great ideas summoned forth by the war. Something of the soul of the nations must enter it so that it can truly bring into being the great work expected of it.

4. Let us repeat that the work of the Congress must consist above all in giving a rational and stable organisation to international relations by founding the League of

Nations and endowing it with the institutions necessary for its normal working on the basis, both possible and practical, that we have been examining in this book. If it is to impress both the mind and the will, all of the Congress's work must be directed towards establishing a World Charter.

5. But such a Congress cannot be improvised. It must be prepared for now.

(a) It is an official task. The Chancelleries of the belligerents, although occupied with the regular work of daily business, are concerned with it already. In all countries governments should now appoint official committees to study the basis of the future treaty and simultaneously to define the objectives of the war.

(b) The responsibility of preparation also falls on the neutral States, who must come to some mutual understanding for this purpose.

(c) Apart from official action, there is a considerable body of research, of genuinely scholarly work to be undertaken in drawing up the working papers of the Congress. This task will fall to specialists. The international associations also have an important role to play because most of the issues were studied by them before the war. They will have to revise their previous work to take account of new developments. Among the associations there are some more directly interested than others in future solutions: those of the jurists, economists, socialists, workers, business men, and the Churches.

(d) Public opinion must be prepared. It is not a question of establishing the how and when of peace, but what it actually means. Basically the people know little about how they have been led to fight each other or what the objectives of victory are. What is required is the creation in the masses of an attitude of mind, a clear understanding of the process that has caught them up, of the machinery in which they have functioned as parts. We can hope for the best only if we can rely upon a body of opinion ready to accept the great transformations that are necessary [6].

Appendices

1. Bibliography Related to the Union of States

- Umano, *Essai de constitution internationale*. Traduction du manuscrit édité par L. Pichot, 1907.
- W. Taft, *Experiments in Federation*; ch. IV of the United States and Peace, 1914.
- Paul Cohn et Alfred Weiss, *Das Neue Europa*. Zurich.
- Fr. Maniecke, *Weltbürgertum u. Nationalstaat*, III Ed., München, Oldenbourg.
- Anarcharsis Clootz, *Projet de république universelle, organisation politique unitaire de toute la planète*.
- H.-J De Tange, *Theorie en praktijk der internationale organisatie*; uitgave van het Comite "De Europeesche Statenbond".
- Rodrigo Octavio, *L'Union juridique des nations-confédérations*.
- Lorimer, *Sur la Communauté internationale*,
- Merignac, *Le Problème final du droit international. (L'Etat international, no 164. Communauté internationale)*.
- Ettore Ponti, *La guerra dei popoli e la futura Confederazione europea, secondo un metodo analogico storico*, 1915.
- Hamilton, *Plan for a League of Peace* put forward in the "Independent".
- Boyle, L. Hommer, *History of Peace* (compiled from governmental records official reports, treaties, conventions, peace conferences and arbitration).

[6] [The bibliography listed in this footnote has been removed to form Appendix 2 of this paper]

-International Federation for the Maintenance of Peace. House Committee on Foreign affairs of U.S. Congress, David J. Foster, Chairman (Hearing of May 7, 1910). On joint resolution to authorize the appointment of a commission to draft articles of international federation and for other purposes

In addition the following have supported a federation in the past: Drysdale, Westerkamp, Fiore, Barthold, Calden, Amaud, Duplessis, Deloncler, etc. M.C. Butler has presented a "Project for United States of Europe" Mr. Lepet has presented in 1907, a new plan in 48 articles for international justice, legislative power and the transformation of military forces. At Lugano in Switzerland, draft "Ligue des neutres" (Bignami). President Roosevelt has proposed an international police force in «The Independent» Mr. Hyndman, the leader of the British socialist party, has supported the federation. The "Woman's Movement for Constructive Peace" (London) has supported the same idea proposed by MM. Pethwick and Lawrence....

-The Periodical "Les Etats-Unis d'Europe" published by la Ligue internationale de la Paix et de la Liberté.

-F.Wrangle, *Internationale Anarchie oder Verfassung*.

Parliament of Man, Federation of the World.

-Wells, *La guerre qui mettra fin aux guerres; La Paix du monde; Demain*.

-Wolf, *An international Authority and the Prevention of War*. The New Statesman, London, July, 10 and 17, 1915.

-P.Bonfarte, *Vers la Confédération européenne*.

"Scientia", LXI, 1915

-Ramsay Muir, *The problem of the future Peace*, "Scientia", LXIII, 1915

Earlier proposals for the organisation of pacifists: Pierre Dubios, 1321; Podliebrad, 1462; Erasmus 1514; Henri IV, 1533; Emeric Crucé, 1623; Grotius, 1648; Puffendorf, 1671; William Penn, 1693; Abbé de St.Pierre, 1712; Gondart, 1751; Galliard, 1777; Bentham, 1788; Condorcet, 1790; A.Clootz, 1793; Kant, 1795; Zacharie, 1802; Jean Paul, 1809.

Among earlier proposals special mention should be made of the following: (a) The Plan of Henry IV given in the Memoirs of Sully for the creation of a European Federation: Coalition against the House of Austria, the creation of 15 nearly equal states or dominions, partition of the Christian Republic, a General Council or Senate, a single currency, eventually the creation of a common army against the Turks. (b) The project of Leibnitz who dreamed of a European federation with the Pope and the Emperor jointly at its head; (c) The project for perpetual peace of the Abbé St Pierre following the problems he had observed at the Congress of Utrecht, 1712; (d) Project of Kant (perpetual peace); (e) Project of Bentham (Essay on international law proposing the meeting of a general Diet).

Resolutions of the Peace Congress: Paris, 1849; London 1890; Hamburg, 1897; Munich, 1907; London, 1908.

2. Bibliography on the Peace Conference

- Ernest Fayle, *The great settlement*. Preface by Lord Esher, 1915.

- G. Martin, *Problèmes de la Paix*.

- Ch. Dumas, *La paix que nous voulons*, 1915.

- D. Triesch, *Die Welt nach dem Kriege*, Berlin, Puttkammer.

- Moneta, *Les pacifistes dans le mouvement historique actuel. Comment rendre durable la paix prochaine*, "La vita Internazionale", Milan, 5 and 20 avril, 5 mai, 1915.

- E. Soulier, *Pas de paix hors de la justice*.

H.-G. Wells, *La guerre qui tuera la guerre; Demain?* (an attempt at prophecy).

- Dr. Ch. Eliot, *Le chemin qui mène à la paix*.

- Colonel Biollot, *L'Europe qu'il nous faut faire*.

- Eugenio Rignano (directeur de "Scientia"), *Les facteurs de la guerre et le problème de la paix* (conclusions d'une enquête internationale).

- "Demain", direct H. Guillebaux.

World Peace Foundation, series of pamphlets, avril 1915: article by Lord Dickinson: *Sur les bases à adopter pour la création d'une Ligue pour la Paix*, with appendices on the plan for a congress of neutrals proposed by the Pan-American Union and the organisation of an International Commission of Enquiry.

- *International Law Association* (report on the future of the war).

- Raymond Unwin, *The War and What after?*

- See also the publications of the Organisation centrale pour la Paix durable, and the work during the War of pacifist groups that can be found listed in French in *La Paix par le Droit*.

- Henry Lyonnell, *Quelle sera la durée de la guerre? Comment la guerre doit-elle finir?*

- XXX, *Ce que sera la paix de demain*.

- Ponteville, *Après la guerre: L'Allemagne, la France, la Belgique et la Hollande*.

- Abbé Wetterlé, *Si nous voulons une paix durable. Étude documentée dans "j'ai vu"*.

- A. Aulard, *La paix future d'après la Révolution française et Kant*.

- XXX, *La paix que nous devons faire. Le remaniement de l'Europe*.

- Commandant Espérandieu, *Le Rhin français*, 1915.

- Onésime Reclus, *L'Allemagne en morceaux* (paix draconienne). *Annexion de la rive gauche. Sa moralité, sa nécessité, ses avantages. Le partage de l'Allemagne*, 1915.

- Camille Julian, *Le Rhin gaulois*. 1915.

- Lieutenant-colonel R. De D., *Le partage de l'Allemagne, l'échéance de demain*.

- Probus, *La plus grande France, les clauses de la paix, les fruits de la victoire.*
- Frank Chauveau, *La paix et la frontière du Rhin.*
- A. Sommerfeld, *Le partage de la France.*

Editor's Notes

1. These pages are taken from Part 3, "L'Organisation de la Société des nations," of Otlet's *Les Problèmes internationaux et la guerre*. (Geneva: Librairie Kundig and Paris: Rousseau et Cie, 1916), pp 421-427 and 482-485.
2. It is possible that Otlet is mistaken in this. The parallel French and English text of the "Final Act of the Second Peace Conference held at the Hague in 1907" (British Parliamentary Papers Miscellaneous, no. 6 (1908) Cd 4175) does not use the phrase, "Société des Nations."
3. The Central Organisation for a Durable Peace that Otlet mentions in his footnote was set up in the Hague in 1915. Forty nations were represented in this organisation which adopted and revised "The Minimum Programme" published in November 1914 by the Dutch Anti-War Council. It was one of the most important European peace proposals. Otlet was a member of the Central Organisation's Executive Committee and in 1916 Nijhoff published on its behalf his *Mesures concertées prises entre les états: L'Exécutif international* in which he examined the feasibility of the recommendations contained in Article 3 Item 3 of the Minimum Programme.
4. The Peace of Westphalia ended the Thirty Years War. Two treaties were concluded at neighbouring towns in Westphalia: one at Münster between the Bourbon and Hapsburg Dynasties; the other at Osnabrück between Sweden and the Holy Roman Empire. Negotiations began in 1641, but the treaties were not signed until 1648. They recognized the independence of the German states and so marked the demise of the Holy Roman Empire.
5. For the Treaty of Westphalia see note 4 above. The Congress of Vienna met in 1814 and again in 1815 to settle the European peace after the Napoleonic wars. The negotiations are of interest because of the relationship of the great powers and the smaller ones, and the emergence through the Concert of Europe of a balance of power in Europe maintained by means of a subtle and shifting system of alliances. The Provisions of the final Congress Act and related Treaties remained in force for more than 40 years and helped keep the general peace intact until the outbreak of the First World War.
6. The first International Peace Conference at the Hague was called in 1899 on the initiative of the Tsar of Russia. His aim was to find a way of reducing the burden of increasing levels of armaments throughout Europe. Representatives of twenty-six States attended from May 18 to July 29 1899. Three conventions were adopted: the first set up an International Court of Arbitration for the Pacific Settlement of International Disputes; the second dealt with the Laws and Customs of War on Land; and the third dealt with the regulation of maritime warfare. The second conference, in 1907, was attended by representatives of 44 powers and adopted 13 conventions regulating the conduct of war. Both Otlet and La Fontaine were observers at the 1907 Conference and Otlet's assessment of it is presented in his *Loi*

d'ampliation et internationalisme (Bruxelles; Imprimerie Polleunis et Ceuterick, 1908). This is the text of a long paper for the Belgian Sociological Society.

7. Only a portion of the bibliography presented in sketchy detail by Otlet and as an undifferentiated block of a footnote is given in the appendix. The footnote of which it is an "excerpt" is odd. In the middle of the bibliographical enumeration, Otlet lists names of those who have declared themselves in favour of a world federation. The bibliographical listing then continues in the same form as before. At the end of the footnote Otlet lists past schemes for pacifist organisations beginning with Pierre Dubois in 1321 and concluding with Jean Paul in 1809. He then singles out for brief discussion several of these. The footnote concludes without grammatical connection with a list of Peace Congresses.
8. Otlet's reference here is presumably to the Convention Respecting the Rights and Duties of Neutral Powers and Persons in Case of War on Land which was drawn up at the 1907 Hague Conference.
9. For the Congress of Westphalia see Note 4 above and for the Congress of Vienna, see Note 5 above.
10. The Congress of Paris, February 25th to April 16th 1856, ended the Crimean War in which Great Britain and France defended Turkey against Russia.
11. The Congress of Berlin met June 13 to July 13 1878 in order to settle the affairs of Russia and Turkey in the Balkans. Russia had declared war on Turkey in April 1877. Modern Bulgaria was in effect created by the Treaty of Berlin though it remained nominally under the vassalage of Turkey. Several of the other Balkan states received territorial adjustments that inflamed their dissatisfaction, the ambitions of Russia for Constantinople were checked and the presence of Turkey in Europe, though curtailed, was maintained.
12. The Conference of Berlin met from October 1884 to February 1885 to define the principles on which the various European interests in the Congo basin in central Africa should be regulated. The treaty created a huge free trade area and the existence of the Congo Free State, which almost immediately became the personal domain of Léopold II, King of the Belgians, was recognised. This was of lifelong interest to Otlet. See his *Afrique aux noirs* 1888 and "Léopold II et nos villes", 1928.
13. The Conference of Algeciras met from January 16 to April 17 1906, to deal with German claims to interests in Morocco which, through agreements between Britain, France and Spain had come principally under the protection of France.
14. For the Hague Peace Conferences see Note 6 above.
15. The allies had landed troops at Salonika in late 1915 to help Greece fulfil her treaty obligations to Serbia at the invitation of Prime Minister Venizelos, and against the opposition of King Constantine. Allied troops remained there until the end of the War. In 1916, a revolution against the pro-German King and Royalist forces led to an allied blockade and to allied and Venizelist Greek troops occupying Athens and taking control of the Greek fleet and the railways.
16. In a background paper on Belgium for the Paris Peace Conference, Charles A. Haskins writes: "the Scheldt is the great commercial highway of Belgium and her chief means of communication with the outside world, yet the sovereignty over the

lower course of the river, for forty-five miles, is exercised by Holland in such a way as to limit Belgium in time of peace and to close the river to all navigation in time of war. Holland's policy has been essentially negative and selfish injuring Antwerp, for benefit of Rotterdam." (David Hunter Miller, *My Diary of the Conference of Paris with Documents* Vol. 5, p.3).

17. During the war there had been discussion of connecting the Rhône and the Rhine by canal, thus giving Switzerland via the Rhône access to the Mediterranean. The Savoy zone, which embraces the Rhône, and abuts Geneva, was one of several zones recognised by the Congress of Vienna as "free" or militarily neutral. These zones also had "economic servitudes" imposed on them to facilitate commerce between them and the Canton of Geneva. French customs officers began to appear in the region, officially French, during the war. Towards the end of the war there was talk of abrogating the neutrality of the zones (this in fact occurred and was written into the Treaty of Versailles).
18. Otlet refers to the famous Twenty-One Demands made by Japan of China on January 18th, 1915. China accepted them on 8th May and a treaty was signed 25th May. This gave Japan effective control of Shantung, Southern Manchuria and parts of Eastern Mongolia.
19. The U.S.'s victories in the Spanish-American war of 1898 resulted in the acquisition of Pacific and Caribbean territories requiring the maintenance of U.S. naval power. After 1898, the U.S. developed a strong expansionist naval policy, although its navy remained inferior in size both to that of Great Britain and Germany. In 1904 the U.S. promulgated the "Roosevelt Corollary" to the Monroe Doctrine. This asserted a police-keeping responsibility for the U.S. in Latin America to protect lives and to enforce treaty rights. The Pan-American Union had been created as the International Union of American Republics by an International Conference in 1890, which met again in 1901, 1906 and 1910. It took the name Pan American Union in 1910 and became the Organisation of American States in 1948, though its permanent body in Washington, D.C., has kept the earlier name.

The reference to the U.S.'s concern about naval warfare no doubt is to its objection to the 1915 German submarine blockade of Great Britain and Ireland as a violation of the freedom of the high seas and of the rights of neutral states. The US made strong protests to Germany over various incidents involving US citizens and commercial interests in 1915 and 1916; eventually the introduction of unrestricted submarine warfare by Germany helped lead the United States into the war on the side of the Allies.

20. The armistice ending the Franco-Prussian war was signed January 28th, 1871. A Preliminary Peace Treaty was signed at Versailles February 26th and the Final Treaty at Frankfurt on May 10th, a period rather less than 120 days.
21. At the time Otlet was writing those fighting on the side of the Allied or Entente powers were Great Britain, Russia, France, Italy, Montenegro, Serbia, Portugal(entered the War March 1916) and Romania (entered the War August 17th, 1916). Japan had declared war against Germany August 23rd 1914 and against Austria-Hungary August 25th. Depending on when Otlet's work was published in 1916 he may be referring either to Portugal or Romania as one of the eight. On the side the Central Powers were Austro-Hungary, Germany, Turkey and Bulgaria.

12. TRANSFORMATIONS IN THE BIBLIOGRAPHICAL APPARATUS OF THE SCIENCES¹

Repertory -- Classification -- Office of Documentation

1. Because of its length, its extension to all countries, the profound harm that it has created in everyone's life, the War has had, and will continue to have, repercussions for scientific productivity. The hour for the revision of the old order is about to strike. Forced by the need for economies of men and money, and by the necessity of greater productivity in order to hold out against all the competition, we are going to have to introduce reforms into each of the branches of the organisation of science: scientific research, the preservation of its results, and their wide diffusion.

Everything happens simultaneously and the distinctions that we will introduce here are only to facilitate our thinking. Always adjacent areas, or even those that are very distant, exert an influence on each other. This is why we should recognize the impetus, growing each day even greater in the organisation of science, of the three great trends of our times: the power of associations, technological progress and the democratic orientation of institutions. We would like here to draw attention to some of their consequences for the book in its capacity as an instrument for recording what has been discovered and as a necessary means for stimulating new discoveries.

The Book, the Library in which it is preserved, and the Catalogue which lists it, have seemed for a long time as if they had achieved their heights of perfection or at least were so satisfactory that serious changes need not be contemplated. This may have been so up to the end of the last century. But for a score of years great changes have been occurring before our very eyes. The increasing production of books and periodicals has revealed the inadequacy of older methods. The increasing internationalisation of science has required workers to extend the range of their bibliographic investigations. As a result, a movement has occurred in all countries, especially Germany, the United States and England, for the expansion and improvement of libraries and for an increase in their numbers. Publishers have been searching for new, more flexible, better-illustrated, and cheaper forms of publication that are better-coordinated with each other. Cataloguing enterprises on a vast scale have been carried out, such as the International Catalogue of Scientific Literature and the Universal Bibliographic Repertory.²

Three facts, three ideas, especially merit study for they represent something really new which in the future can give us direction in this area. They are: The Repertory, Classification and the Office of Documentation.



2. The Repertory, like the book, has gradually been increasing in size, and improvements in it suggest the emergence of something new which will radically modify our traditional ideas.

From the point of view of form, a book can be defined as a group of pages cut to the same format and gathered together in such a way as to form a whole. It was not always so. For a long time the Book was a roll, a *volumen*. The substances which then took the place of paper - papyrus and parchment - were written on continuously from beginning to end. Reading required unrolling. This was certainly not very practical for the consultation of particular passages or for writing on the verso. The *codex*, which was introduced in the first centuries of the modern era and which is the basis of our present book, removed these inconveniences. But its faults are numerous. It constitutes something completed, finished, not susceptible of addition. The Periodical with its successive issues has given science a continuous means of concentrating its results. But, in its turn, the collections that it forms runs into the obstacle of disorder. It is impossible to link similar or connected items; they are added to one another pell-mell, and research requires handling great masses of heavy paper. Of course indexes are a help and have led to progress - subject indexes, sometimes arranged systematically, sometimes analytically, and indexes of names of persons and places. These annual indexes are preceded by monthly abstracts and are followed by general indexes cumulated every five, ten or twenty-five years. This is progress, but the Repertory constitutes much greater progress,

The aim of the Repertory is to detach what the book amalgamates, to reduce all that is complex to its elements and to devote a page to each. Pages, here, are leaves or cards according to the format adopted. This is the "monographic" principle pushed to its ultimate conclusion. No more binding or, if it continues to exist, it will become movable, that is to say, at any moment the cards held fast by a pin or a connecting rod or any other method of conjunction can be released. New cards can then be intercalated, replacing old ones, and a new arrangement made.

The Repertory was born of the Catalogue. In such a work, the necessity for intercalations was clear. Nor was there any doubt as to the unitary or monographic notion: one work, one title; one title, one card. As a result, registers which listed the same collections of books for each library but which had constantly to be re-done as the collections expanded, have gradually been discarded. This was practical and justified by experience. But upon reflection one wonders whether the new techniques might not be more generally applied.

What is a book, in fact, if not a single continuous line which has initially been cut to the length of a page and then cut again to the size of a justified line? Now, this cutting up, this division, is purely mechanical; it does not correspond to any division of ideas. The Repertory provides a practical means of physically dividing the book according to the intellectual division of ideas.

Thus, the manuscript library catalogue on cards has been quickly followed by catalogues printed on cards (American Library Bureau, the Catalogue or the Library of Congress in Washington)³; then by bibliographies printed on cards (International Institute of Bibliography, *Concilium Bibliographicum*)⁴; next, indices of species have been published on cards (*Index Speciorum*)⁵. We have moved from the small card to the

large card, the leaf, and have witnessed compendia abandoning the old form for the new (*Jurisclasseur*, or legal digests in card form). Even the idea of the encyclopedia has taken this form (Nelson Perpetual Cyclopedias⁶).

Theoretically and technically, we now have in the Repertory a new instrument for analytically or monographically recording data, ideas, information. The system has been improved by divisionary cards of various shapes and colours, placed in such a way that they express externally the outline of the classification being used and reduce search time to a minimum. It has been improved further by the possibility of using, by cutting and pasting, materials that have been printed on large leaves or even books that have been published without any thought of repertoires. Two copies, the first providing the recto, the second the verso, can supply all that is necessary. One has gone even further still and, from the example of statistical machines like those in use at the Census of Washington (*sic*)⁷, extrapolated the principle of "selection machines" which perform mechanical searches in enormous masses of materials, the machines retaining from the thousands of cards processed by them only those related to the question asked.

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3. But such a development, like the Repertory before it, presupposes a classification. This leads us to examine the second practical idea that is bringing about the transformation of the book.

Classification plays an enormous role in scientific thought. If one could say that a science was a well-made language, one could equally assert that it is a completed classification. Science is made up of verified facts which are organised in a structure of systems, hypotheses, theories, laws. If there is a certain order in things, it is necessary to have it also in science which reflects and explains nature. That is why, since the time of Greek thought until the present, constant efforts have been made to improve classification. These have taken three principal directions: classification studied as an activity of the mind; the general classification and sequence of the sciences; the systematization appropriate to each discipline. The idea of order, class, genus and species has been studied since Aristotle, in passing by Porphyrus, by the scholastic philosophers and by modern logicians. The classification of knowledge goes back to the Greeks and owes much to the contributions of Bacon and the Renaissance. It was posed as a distinct and separate problem by D'Alembert and the *Encyclopédie*, and by Ampère, Comte, and Spencer. The recent work of Manouvrier, Durand de Cros, Goblot, Naville, de la Grasserie, has focussed on various aspects of it.⁸ As to systematics, one can say that this has become the very basis of the organisation of knowledge as a body of science. When one has demonstrated the existence of 28 million stars, a million chemical compounds, 300,000 vegetable species, 200,000 animal species, etc., it is necessary to have a means, an Ariadne's thread, of finding one's way through the labyrinth formed by all these objects of study. Because there are sciences of beings as well as sciences of phenomena, and because they intersect with each other as we better understand the whole of reality, it is necessary that this means be used to retrieve both. The state of development of a science is reflected at any given time by its systematics, just as the general classification of the sciences reflects the state of development of the encyclopedia, of the philosophy of knowledge.

The need has been felt, however, for a practical instrument of classification. The classifications of which we have just spoken are constantly changing, at least in their detail if not in broad outline. In practice, such instability, such variability which is dependent on the moment, on schools of thought and individuals, is not acceptable. Just as the Repertory had its origin in the catalogue, so practical classification originated in the Library. Books represent knowledge and it is necessary to arrange them in collections. Schemes for this have been devised since the Middle Ages. The elaboration of grand systems occurred in the 17th and 18th centuries and some new ones were added in the 19th century. But when bibliography began to emerge as an autonomous field of study, it soon began to develop along the lines of the catalogue of an ideal library comprising the totality of what had been published. From this to drawing on library classifications was but a step, and it was taken under certain conditions which must be stressed.

Up to the present time, 170 different classifications have been identified. Now, no cooperation is possible if everyone stays shut up in his own system. It has been necessary, therefore, to choose a universal classification and to recommend it as such in the same way that the French Convention recognized the necessity of a universal system of weights and measures. In 1895 the first International Conference of Bibliography chose the Decimal Classification and adopted a complete plan for its development. In 1904, the edition of the expanded tables appeared. A new edition was being prepared when the war broke out. Brussels, headquarters of the International Institute of Bibliography, which was doing this work, was part of the invaded territory.

In its latest state, the Decimal Classification has become an instrument of great precision which can meet many needs. The printed tables contain 33,000 divisions and they have an alphabetical index consisting of about 38,000 words. Learning is here represented in its entire sweep: the encyclopedia of knowledge. Its principle is very simple. The empiricism of an alphabetical classification by subject-heading cannot meet the need for organising and systematizing knowledge. There is scattering; there is also the difficulty of dealing with the complex expressions which one finds in the modern terminology of disciplines like medicine, technology, and the social sciences. Above all, it is impossible to achieve any international cooperation on such a national basis as language. The Decimal Classification is a vast systematization of knowledge, "the table of contents of the tables of contents" of all treatises. But, as it would be impossible to find a particular subject's relative place by reference to another subject, a system of numbering is needed. This is decimal, which an example will make clear. Optical Physiology would be classified thus:

5th Class	Natural Sciences
3rd Group	Physics
5th Division	Optics
7th Sub-division	Optical Physiology

or 535.7

This number 535.7 is called decimal because all knowledge is taken as one of which each science is a fraction and each individual subject is a decimal subdivided to a lesser or

greater degree. For the sake of abbreviation, the zero of the complete number, which would be 0.5357, has been suppressed because the zero would be repeated in front of each number. The numbers 5, 3, 5, 7 (which one could call five hundred and thirty-five point seven and which could be arranged in blocks of three as for the telephone, or in groups of twos) form a single number when the implied words, "class, group, division and subdivision," are uttered.

The classification is also called decimal because all subjects are divided into ten classes, then each of these into at least ten groups, and each group into at least ten divisions. All that is needed for the number 535.7 always to have the same meaning is to translate the tables into all languages. All that is needed to deal with future scientific developments in optical physiology in all of its ramifications is to subdivide this number by further decimal numbers corresponding to the subdivisions of the subject. Finally, all that is needed to ensure that any document or item pertaining to optical physiology finds its place within the sum total of scientific subjects is to write this number on it. In the alphabetic index to the tables references are made from each word to the classification number just as the index of a book refers to page numbers.

This first remarkable principle of the decimal classification is generally understood. Its second, which has been introduced more recently, is less well known: the combination of various classification numbers whenever there is some utility in expressing a compound or complex heading. In the social sciences, *statistics* is 31 and *salaries*, 331.2. By a convention these numbers can be joined by the simple sign : and one may write 31:331.2 *statistics of salaries* [1].

This indicates a general relationship, but a subject also has its place in space and time. The subject may be *salaries in France* limited to a period such as the 18th century (that is to say, from 1700 to 1799). The sign that characterises division by place being the parenthesis and that by time quotation marks or double parentheses, one can write:

33:331.2 (44) <<17>> *statistics - of salaries - in France - in the 17th century*

or ten figures and three signs to indicate, in terms of the universe of knowledge, four subordinated headings comprising 42 letters. And all of these numbers are reversible and can be used for geographic or chronologic classification as well as for subject classification:

(44) 31:331.2 <<17>> *France - Statistics - Salaries - 17th Century*

<<17>> (44) 31:331.2 *17th Century - France - Statistics - Salaries*

The subdivisions of relation and location explained here, are completed by documentary subdivisions for the form and the language of the document (for example,

[1] The first ten divisions are: 0 Generalities, 1 Philosophy, 2 Religion, 3 Social Sciences, 4 Philology, Language, 5 Pure Sciences, 6 Applied Science, Medicine, 7 Fine Arts, 8 Literature, 9 History and Geography. The Index number 31 is derived from: 3rd class *social sciences*, 1st group *statistics*. The Index number 331.2 is derived from 3rd class *social sciences*, 3rd group *political economy*, 1st division *topics about work*, 2nd subdivision *salaries*.

periodical, in Italian), and by functional subdivisions (for example, in zoology all the divisions by species of animal being subdivided by biological aspects). It follows by virtue of the law of permutations and combinations that the present tables of the classification permit the formulation at will of millions of classification numbers. Just as arithmetic does not give us all the numbers ready-made but rather a means of forming them as we need them, so the classification gives us the means of creating classification numbers insofar as we have compound headings that must be translated into a notation of numbers.

Like chemistry, mathematics and music, bibliography thus has its own extremely simple notations: numbers. Immediately and without confusion, it allows us to find a place for each idea, for each thing and consequently for each book, article, or document and even for each part of a book or document. Thus it allows us to take our bearings in the midst of the sources of knowledge, just as the system of geographic coordinates allows us to take our bearings on land or sea.

One may well imagine the usefulness of such a classification to the Repertory. It has rid us of the difficulty of not having continuous pagination. Cards to be intercalated can be placed according to their class number and the numbering is that of tables drawn up in advance, once and for all, and maintained with an unvarying meaning. As the classification has a very general use, it constitutes a true documentary classification which can be used in various kinds of repertoires: bibliographic repertoires; catalogue-like repertoires of objects, persons, phenomena; and documentary repertoires of files made up of written or printed materials of all kinds. The possibility can be envisaged of encyclopedic repertoires in which are registered and integrated the diverse data of a scientific field and which draw for this purpose on materials published in periodicals. Let each article, each report, each item of news henceforth carry a classification number and, automatically, by clipping, encyclopedias on cards can be created in which all the results of international scientific cooperation are brought together at the same number. This constitutes a profound change in the technology of the Book, since the repertory thus formed is simultaneously a constantly up-dated book and a cooperative book in which are found printed elements produced in all locations.

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4. If we can realize the third idea, the Office of Documentation, then reform will be complete. Such an office is the old library, but adapted to a new function. Hitherto the library has been a museum of books. Works were preserved in libraries because they were precious objects. Librarians were keepers. Such establishments were not organised primarily for the use of documents. Moreover, their outmoded regulations if they did not exclude the most modern forms of publication at least did not admit them. They have poor collections of journals; collections of newspapers are nearly nonexistent; photographs, films, phonograph discs have no place in them, nor do film negatives, microscopic slides and many other "documents." The subject catalogue is considered secondary in the library so long as there is a good register for administrative purposes. Thus there is little possibility of developing repertoires in the library, that is to say of taking publications to pieces and redistributing them in a more directly and quickly

accessible form. For want of personnel to arrange them, there has not even been a place for the cards that are received already printed.

The Office of Documentation, on the contrary, is conceived of in such a way as to achieve all that is lacking in the library. Collections of books are the necessary basis for it, but books, far from being considered as finished products, are simply materials which must be developed more fully. This development consists in establishing the connections each individual book has with all of the other books and forming from them all what might be called The Universal Book. It is for this that we use repertoires: bibliographic repertoires; repertoires of documentary dossiers gathering pamphlets and extracts together by subject; catalogues; chronological repertoires of facts or alphabetical ones of names; encyclopedic repertoires of scientific data, of laws, of patents, of physical and technical constants, of statistics, etc. All of these repertoires will be set up according to the method described above and arranged by the same universal classification. As soon as an organisation to contain these repertoires is created, the Office of Documentation, one may be sure that what happened to the book when libraries first opened - scientific publication was regularised and intensified - will happen to them. Then there will be good reason for producing in bibliographies, catalogues, and above all in books and periodicals themselves, the rational changes which technology and the creative imagination suggest. What is still an exception today will be common tomorrow. New possibilities will exist for cooperative work and for the more effective organisation of science.

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5. Repertory, Classification, Office of Documentation are therefore the three related elements of a single reform in our methods of registering scientific discoveries and making them available to the greatest number of people. Already one must speak less of experiments and uncertain trials than of the beginning of serious achievement. The International Institute of Bibliography in Brussels constitutes a vast intellectual cooperative whose members are becoming more numerous each day. Associations, scientific establishments, periodical publications, scientific and technical workers of every kind are affiliating with it. Its repertoires contain millions of cards. There are sections in several countries [2]. But this was before the War. Since its outbreak, a movement in France, England and the United States has been emerging everywhere to improve the organisation of the Book. The Office of Documentation has been suggested as the solution for the requirements that have been discussed.

It is important that the world of science and technology should support this movement and above all that it should endeavour to apply the new methods to the works which it will be necessary to re-organise. Among the most important of these is the *International Catalogue of Scientific Literature*, that fine and great work begun at the initiative of the Royal Society of London. Until now, this work has been carried on

[2] In France, the Bureau Bibliographique de Paris and great associations such as the Société pour l'encouragement de l'industrie nationale, l'Association pour l'avancement des sciences, etc., are affiliated with it.

without relation to other works of the same kind: it has not recognised the value of a card repertory or a universal classification. It must recognise them in the future [3].

Editor's Notes

1. "Transformations opérées dans l'appareil bibliographique des sciences," *Revue scientifique* 58 (1918): 236-241.
2. *The International Catalogue of Scientific Literature*, an enormous work, was compiled by a Central Bureau under the sponsorship of the Royal Society from material sent in from Regional Bureaus around the world. It was published annually beginning in 1902 in 17 parts each corresponding to a major subject division and comprising one or more volumes. Publication was effectively suspended in 1914.

By the time war broke out, the Universal Bibliographic Repertory contained over 11 million entries.

3. For card publication by the Library Bureau and Library of Congress, see Edith Scott, "The Evolution of Bibliographic Systems in the United States, 1876-1945" and Editor's Note 36 to the second paper in this volume and Note 5 to the seventh paper.
4. Otlet refers to the Concilium Bibliographicum also in Paper No.7, "The Reform of National Bibliographies..." in this volume. See also Editor's Note 5 in that paper for the major bibliographies published by the Concilium Bibliographicum.
5. A possible example of what Otlet is referring to here is the Gray Herbarium Index. This was "planned to provide cards for all the names of vascular plant taxa attributable to the Western Hemisphere beginning with the literature of 1886" (*Gray Herbarium Index*, Preface, p. iii). Under its first compiler, 20 instalments consisting in all of 28,000 cards were issued between 1894 and 1903. It has been continued after that time and was for many years "issued quarterly at the rate of about 4,000 cards per year." At the time the cards were reproduced in a printed catalogue by G.K. Hall in 1968, there were 85 subscribers to the card sets.
6. Nelson's *Perpetual Loose-Leaf Encyclopedia* was a popular, 12-volume work which went through many editions, its principle being set down at the beginning of the century. It was published in binders and the publisher undertook to supply a certain number of pages of revisions (or renewals) semi-annually after each edition, the first

[3] See Paul Otlet, *La Documentation et l'information au service de l'industrie* Bulletin de la Société d'encouragement à l'industrie nationale, June 1917. - *La Documentation au service de l'invention*. Euréka, October 1917. - *L'Institut International de Bibliographie*. Bibliographie de la France, 21 December 1917. - *La Réorganisation du Catalogue international de la littérature scientifique*. Revue générale des sciences, 15 February 1918. - The publications of the Institute, especially the expanded tables of the Decimal Classification, have been deposited at the Bureau Bibliographique de Paris, 44 rue de Rennes, at the apartments of the Société de l'encouragement. - See also the report presented by General Sebert⁹ to the Congrès du Génie civil, in March 1918 and whose conclusions about the creation in Paris of a National Office of Technical Documentation have been adopted.

of which appeared in 1905. An interesting reference presumably to this work occurs in a notice, "An Encyclopedia on the Card-Index System," in the *Scientific American* 109 (1913): 213. The Berlin Correspondent of the journal reports a proposal made in Berlin which contains "an idea, in a sense ... already carried out in an American loose-leaf encyclopedia, the publishers of which supply new pages to take the place of those that are obsolete" (Nelsons, an English firm, set up a New York branch in 1896. Publication in the U.S. of works to be widely circulated there was a requirement of the copyright law.) The reporter observes that the principle suggested "affords a means of recording all facts at present known as well as those to be discovered in the future, with the same safety and ease as though they were registered in our memory, by providing a universal encyclopedia, incessantly keeping abreast of the state of human knowledge." The "bookish" form of conventional encyclopedias acts against its future success. "In the case of a mere storehouse of facts the infinitely more mobile form of the card index should however be adopted, possibly," the author goes on making a most interesting reference, "in conjunction with Dr. Goldschmidt's Microphotographic Library System." The need for a central institute, the nature of its work, the advantages of the work so organised are described in language that is reminiscent of that of Paul Otlet (see also the papers of Goldschmidt and Otlet translated in this present volume).

7. These machines were derived from Herman Hollerith's punched cards and tabulating machines. Hollerith had introduced them under contract into the U.S. Bureau of the Census for the 1890 census. This equipment was later modified and developed by the Bureau. Hollerith, his invention and his business connections lie at the roots of the present IBM company. The equipment and its uses in the census from 1890 to 1910 are briefly described in John H. Blodgett and Claire K. Schultz, "Herman Hollerith: Data Processing Pioneer," *American Documentation* 20 (1969): 221-226. As they observe, suggesting the accuracy of Otlet's extrapolation, "his was not simply a calculating machine, it performed selective sorting, an operation basic to all information retrieval."
8. The history of the classification of knowledge has been treated in English in detail by E.C. Richardson in his *Classification Theoretical and Practical*, the first edition of which appeared in 1901 and was followed by editions in 1912 and 1930. A different treatment is given in Robert Flint's *Philosophy as Scientia Scientiarum: a History of the Classification of the Sciences* which appeared in 1904. Neither of these works deal with Manouvrier, a French anthropologist, or Durand de Cros. Joseph-Pierre Durand, sometimes called Durand de Cros after his birth place, was a French physiologist and philosopher who died in 1900. In his *Traité de documentation*, in the context of his discussion of classification, Otlet refers to an *Essai de taxonomie* by Durand published by Alcan. It seems that this is an error for *Aperçus de taxonomie* (Alcan, 1899).
9. General Hippolyte Sebert was President of the Association française pour l'avancement des sciences, and the Société d'encouragement à l'industrie nationale. He had been active in the foundation of the Bureau bibliographique de Paris. For other biographical information about him see Editor's Note 9 to Paper no 17, "Henri La Fontaine", in this volume.

**13. ON THE ORGANISATION OF INTELLECTUAL WORK WITHIN THE
LEAGUE OF NATIONS:
REPORT AND RESOLUTION PRESENTED BY THE UNION OF
INTERNATIONAL ASSOCIATIONS¹**

The League of Nations has been kind enough to receive previous communications from the Union of International Associations concerning the place intellectual and moral interests should have in the organisation of the League. The Union requests that it receive on this subject the following resolution just adopted by the Congress of International Associations held at Brussels on the 5 September, 1920.

Resolution. That the League of Nations set up an international organisation for intellectual work analogous to the organisations already created for labour, health, and economic matters.²

This organisation, inspired by the particular needs of intellectual work, should enjoy a considerable degree of autonomy in the manner of that given the International Labour Office. Its objective will be to assist in the rapid development of science and education by coordinating the activities of three groups of organisations: the major national intellectual institutions in various countries; the major international associations now existing or to be created whose goals are study and research; and the major international intellectual institutions now existing or to be created (scientific bureaux, the International University, the International Institute of Bibliography, the International Library, the International Museum, International Laboratories, the International Office of Patents and Inventions, the Standards Institute, Institute for Social Research, etc., etc.).³

Towards this end, it is desirable that the League of Nations with the briefest delay organise an International Intellectual Conference to draw up the statutes of such an organisation and also to formulate conclusions and recommendations on the problems of international reconstruction along the lines of those just formulated for International Finance Conference for economic matters.⁴

Rationale

This resolution is justified by the need to achieve the League's fullest development according to its charter and to make it an organ which will coordinate all interests of an international nature. We must therefore appeal to Learning and to the institutions it has created to assist in resolving conflicts between nations and the antagonisms of work and capital. Science must also be encouraged to wrest promptly from nature the secret of new sources of energy and wealth that could make good the disasters of the war and increase the prosperity of the nations.

Experience has shown that today international politics cannot be conducted rationally if economic factors are neglected because of the real community of interest

that unites all elements of life. It teaches us also that politics can only lead to incomplete and artificial solutions and, in certain areas, solutions of no value if intellectual factors are not considered. It is necessary that the representatives of the Intellect, quite as much as those of labour, industry and finance, formulate the concepts that will lead to progress and to make known in relation to individual interests the conditions that govern the destiny of societies, a destiny based on the objective achievements of learning and the higher goals that must be put forward for the actions of man.

All economic production and all the means of transport are today tributaries of the physical and natural sciences and of mathematics because of the technology founded on them. Hygiene and public health are based on the biological sciences and their development. Government at all levels depends on law where progress is maintained by constant comparison of legislation. Political, social, and municipal organisations tend more and more to seek in history and comparative sociology principles from which to derive their standards.

There are 280 universities and institutions of higher learning throughout the world, about a thousand institutes, laboratories and experimental stations, 25,000 teachers, and half a million students. The annual production of books has risen to nearly 180,000 titles of which about 10,000 are periodical titles regularly publishing original research. This output is preserved in the national libraries of 60 countries, and in more than a thousand important general libraries which have the same function. There are hundreds of learned societies in the civilized world.

These immense intellectual forces and the latent possibilities that they harbour have not yet been sufficiently utilized. Nevertheless they are ready to play their part in the great tasks awaiting planning and organisation.

Something new has been at least suggested if not fully revealed by the War. Knowledge is no longer a matter of pure speculation or simple intellectual curiosity which can be left to its experts alone. It is a great social force to be used for the benefit of the whole human community, a major factor in the maintenance and development of Universal Civilization. And Knowledge needs organisation.

Intellectual interests have spontaneously grouped themselves together beyond national frontiers into many specialized international associations. Associations with similar goals have formed unions and federations. Finally, a great many of these have set up the Union of International Associations, recognising in this way an increasing need for organisation. Between them they have created various services and institutions. Their actions, however, have remained limited; their best plans are still no more than drafts or rough sketches. They do not know to whom they should make their requirements known. Such a state of affairs can hardly continue without enormous waste of energy and the deprivation of immense benefits to human society.

What must be done?

Instead of the irregularly held meetings of an earlier period which were organised through diplomatic channels from time to time with much trouble, it is necessary to have regular, annual meetings. Instead of conferences held behind closed doors by officials and diplomats, it is necessary to have public conferences at which all the different interested parties may be strongly represented. Instead of strictly non-governmental international organisations supported partly by limited subsidies from governments and partly by voluntary subscriptions - and striving with these quite

insufficient means to issue publications, to organise services and collections, and to prepare regulatory measures - it is necessary to have permanent international offices supported by the League of Nations and directed by Councils in which both the various countries and the various disciplines involved are represented. It is necessary, in sum, to have an international system of regulation and the possibility of certain measures being imposed through action of the League of Nations.

The new International Labour Organisation has already realized all of these requirements in its area. It is a question of their extension to the realm of intellectual life.

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The organisation to be created for intellectual interests should have the widest possible scope. Here is a simple listing for it:

1. *Scientific research.* Collaboration between scholars from different countries on the basis of cooperative programmes. International laboratories, experimental stations, scientific exploration and expeditions, research directed towards industrial and social applications.

2. *Education.* International University. Development of academic relations. Facilities to secure these. Dissemination through education of current ideas about conditions of the international community and the League of Nations.

3. *Standardization.* Universal systems of weights and measures. Standardization, terminology, nomenclature.

4. *Documentation and Publications.* Universal Bibliographic Repertory, International Library. Exchanges; international loans. Basic publications prepared cooperatively or with shared costs. The unrestricted circulation of books and periodicals.

5. *Collections.* International protection of works of art and works valuable for the history of mankind. Copies, casts and the reproduction of rare documents. The International Museum.

6. *Relations.* Development of specialized international associations and international scientific congresses.

7. *Protection of Intellectuals.* The international rights of and incentive for scholars, artists, men of letters and educators.

Such a programme has been summarized in the resolutions of the great international congresses [1].

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As to the form to be given to the new organisation, a preparatory conference called by the League of Nations itself would have the task of drawing up its draft constitution. The following points would have to be dealt with. They are indicated here in a preliminary way and on the assumption that the organisation would consist of a general conference and a permanent secretariat.

[1] See particularly the report presented to the World Congress of International Associations 1920 called "Bases d'organisation internationale" and the enquiry into international intellectual associations whose results were published by the Union in the *Annuaire de la vie internationale*.

I. Conference

1. *Objective.* Discussion, on the basis of reports and studies, to give advice and direction to the League of Nations for the protection, administration and development of intellectual interests.

Protective or cooperative arrangements for these interests in relation to economic, political and social matters. The development of general intellectual programmes along the lines followed for economic programmes. The creation and control of international scientific institutions; preparation of their budgets; development of international scientific agreements.

2. *Composition, Members.* Half of the members to be designated by each country and representing governments, independent bodies, associations of an intellectual kind and the members of the teaching profession. Half to be designated by the international associations recognised as and organised for this purpose into a college with special sections.

3. *Operation.* The right of members to an individual vote simply as representatives of the League of Nations. Majority decisions. The proceedings of the conference to be conducted in a general manner according to the principles adopted for the Labour Conference.⁵

II. Secretariat

1. *Objective.* Preparation of the conference's work; execution of its decisions; permanent representation of intellectual interests; relations with non-governmental international associations and scientific congresses.

2. *Composition.* Management by a Council nominated by the Conference and itself appointing one or more Directors assisted by the necessary staff.

3. *Method of Work.* a) Cooperation with international scientific institutions either in existence or to be created; institutions organised into autonomous bodies with or without the cooperation of the non-governmental international associations. In exchange for patronage and subsidy, they should agree to function within the framework of a general programme and according to common methods that will be proposed to them; b) organisation of departments or sections as part of the Secretariat.

Such an organisation would not be at all bureaucratic and would resemble that set up for Labour. According to the terms of the Peace Treaty (Art. 389), the International Labour Office is "associated" with the League of Nations.⁶ It is, however, a separate organisation with characteristics quite different from the other organs of the League. Employee and employer associations are represented in this organisation which is not formed exclusively by the States. The Office is kept vital by permanent contact with these associations.

It is desirable that the international institutions already grouped into a centre at Brussels by the Union of International Associations should be consolidated and developed by the new organisation and should form its core. They constitute the framework of an important intellectual establishment. These institutions comprise the International Institute of Bibliography and Documentation, the International Collective Library and Documentary Archives, the International Museum, and the secretariats of the

major international associations. The International University created last September has just been added to them. This entire group of organisations has now been installed in a vast edifice, the World Palace, which covers more than a hectare. The League of Nations has already expressed its sympathy for this work.⁷

Some of these institutions should simply receive patronage and help from the League of Nations (the International University) according to procedures to be worked out. Others should become international scientific bureaux (the Documentation Service), but all should continue to receive the active support of the Union as well as that of the associations which comprise it. It is important that the Union keep to its role as a non-governmental federation of associations of an intellectual kind and co-exist in parallel to the new organisation, just as the International Federation of Trade Unions co-exists with the International Labour Conference and Office.⁸ On the other hand the work that it has undertaken and the institutions that it has brought together have great usefulness for the administrative and governmental action of the different states. An analogous usefulness will increasingly be the case for the League of Nations itself to the extent that the Union's services and action can be enlarged. This is the reason for not abandoning to its own resources an undertaking which has reached the extreme limit of what is possible unofficially.

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Appendices

Appendix I. Note on the increased scope of the powers of the League of Nations which justifies its involvement with intellectual interests.

The extremely important impetus which the League of Nations has already given to the development of the organisations necessary for international life indirectly justifies the proposition of also creating an organisation of an intellectual kind. Not only has the League established political and legal agencies, it has now established economic and humanitarian agencies also.

The economic institutions are three in number: the Financial Conference, the Labour Office and the Transport Commission:

1. Provision for the organisation of labour was explicitly anticipated in the text of Section XII(*sic* for XIII) of the Treaty of Versailles where it is dealt with in 40 long articles. Its application is not limited to industrial workers, for those who work at sea have received protection at the Conference of Genoa in June-July 1920. The whole process of organising labour is both independent of and also closely associated with the League of Nations (Art. 392). The Secretary-General of the League of Nations is its treasurer; he keeps its official archives and records all the actions which concern it (Treasurer, Recorder and Registrar). He nominates committees of enquiry each time that one state is accused by another of having breached the convention.⁹

2. There were no formal textual provisions for the Transport Commission. There was, however, the realization that a universal plan of organisation for labour and for health would be difficult to achieve unless nations could be drawn together physically

and the obstacle of distance reduced. The Commission has been organised on the basis of Article 23 of the Covenant which deals with the best methods of ensuring and maintaining freedom of communications and transport and with equitable treatment for the commerce of all the members of the League. It is also based on Articles 238 and 379 of the Treaty of Versailles which deal with general conventions for the international regime of transport, ports, waterways and railways.¹⁰

3. Neither the Charter nor the Treaty explicitly deals with economic matters, nevertheless the grave economic crisis which has spread across the world has led to the calling of the International Economic Conference which is to be continued through a permanent body.¹¹

As to the moral and humanitarian measures already taken and the related organisations created by the League of Nations, they are five in number:

a) the International Bureau of Health has been created by virtue of Articles 23a and 25 of the Covenant. It has been set up in relation to the International Office of Public Health which operates in Paris and the Red Cross;¹²

b) the Council has authorized the Secretary-General to collect two million pounds for a campaign against typhus in Poland;¹³

c) the Secretariat has nominated an official with the specific responsibility of becoming informed about everything concerning the white slave trade with a view to setting up an international office whose purpose will be the suppression of the trade as requested by various interested societies;¹⁴

d) certain measures have been taken in preparation for controlling trade in opium;¹⁵

e) finally, the League of Nations has worked with the International Committee of the Red Cross in Geneva, the Young Men's Christian Association and Dr. Nansen for the repatriation of prisoners of war. All of its influence has been exerted to obtain the funds necessary for this work. Its justification in undertaking this task, has been "the amelioration of suffering in the world" as set out in article 25 of the Covenant.¹⁶

It seems clear therefore that the natural development of the League of Nations fully justifies a request for it to extend its work to intellectual matters. The League's constitution is not strictly delimited by the articles of the Covenant or the Peace Treaty. It is the spirit or the reasonable interpretation of these diplomatic instruments that has inspired many of the actions that the League has so far taken. As it now exists, having functioned for twelve months, and as its most authoritative interpreters have defined it, it is neither a world state nor a super-state, nor is it an autocratic organisation or a bureaucratic one. It is, in fact, a great organ of coordination seeking to achieve cooperation in order to protect both democracy and peace [2].

The Preamble to the Covenant expresses very positively the League's goal of making the nations cooperate. It does not limit this cooperation. Its extension to the intellectual sphere is an action conforming to the implicit wishes of its founders. Moreover, it conforms to the text of the Covenant itself. Indeed, the development of agreements in science and education is universally recognized as important for

[2] I. Nitobe. *What the League of Nations has done and is doing. Lecture at the International University.* Brussels, 13-14 Sept. 1920.

maintaining peace. Moreover, increasingly large masses of peoples must have access to the benefits of science and education if democracy is to be effectively developed and defended. Finally the interdependence of all human activities is now fundamental. To achieve progress in economic, health, and moral and humanitarian matters is a threefold task already adopted by the League of Nations in addition to its political and legal tasks. But this also logically implies work for the intellectual progress on which these tasks depend. Steps for coordination in the branches of knowledge must also be taken and they imply the involvement of a great coordinating force, that is the League of Nations.

Appendix II. Note on the International University.

The conference to set up an International University met on the 5 September, 1920. First it heard a report on the creation of the University by the Union of International Associations. It was informed of the results of an enquiry made among universities in various countries and among the international associations, an enquiry which revealed a lively interest in the subject in the academic world. After a general discussion, the conference resolved definitely to set up the university, an experimental session of which it was actually able to see take place. It then charged a committee with examining the draft constitution which had been communicated to it. The text of the statutes presented by the committee was readily adopted unanimously because of the final article which reserved full right of revision in two years time.¹⁷

The first article was expressed thus:

The International University's goal is to unite the universities and international associations in a great, elevated movement of education and universal culture. It should allow a certain number of students to complete their education by being introduced to the international and comparative aspects of all the great questions. Accordingly, it will organise each year, if possible at its headquarters, or in such other place as shall be generally agreed to, a series of courses and lectures. Its sessions will be completed by university visits systematically organised by the different universities.

Universities will be invited to send their professors to these meetings in order to present the general results of their research in a course of lectures. International associations will be invited through their authorized representatives to discuss the status of the most important matters with which they are concerned. States will be invited to set up professorships to publicise their countries, institutions and civilization.

The University will also act as a centre of higher educational study and of scientific, technical and social research. Institutes and laboratories will be attached to it. It will make important contributions towards establishing as close an agreement as possible between the principles that govern the evolution of civilizations and the development of the League of Nations.

The Statutes provide for a governing body of 21 members; the use of two official languages, French and English, though leaving to each instructor the option of teaching in the language of his choice provided that it is widely used; the creation of an administrative headquarters in the International Centre in Brussels; and the cooperation of the League of Nations as well as that of the international associations and the International Federation of Students.

The first Session of the International University was held from the 5th to the 20th September. Courses and lectures took place every day. Forty-seven professors from ten different countries (England, Belgium, Spain, the United States, France, Holland,

Japan, Mexico, Poland and Switzerland) gave a total of 143 lectures. Thirteen international associations created chairs. A presentation on the work accomplished by the League of Nations was made by its own delegate. The International Labour Office promised its cooperation. A hundred students from eleven different countries attended the course. A hundred independent auditors joined them. Mornings from 9 until 12 were devoted to oral presentations. On certain days the five lecture halls of the university were all occupied at the same time. Afternoons were devoted to educational visits and scientific excursions. The subjects dealt with were those of the general programme but always with an orientation towards recent scientific progress and towards the problems of world reconstruction and the League of Nations.

The proposal for an International University was presented to the League of Nations at the beginning of 1920 and support was requested from it. At its St. Sebastian meeting, following a report by M. Léon Bourgeois, the Council of the League adopted this resolution: "To convey to the Union of International Associations an expression of sympathy for the work which it is undertaking for the International University and of best wishes for its success, and to assure the Union that the General Secretariat of the League of Nations is authorized to assist in every way possible the achievement of the internationally important work that the University is to engage in." In a letter dated 14 August 1920, Sir Eric Drummond communicated this decision and, although the university session was to commence a fortnight later, it was still possible to do something in terms of publicity.¹⁸

The Conference has thanked the League for its expression of sympathy. It has requested the League to offer patronage, to recognize it as an institution of international utility according to the terms of articles 24 and 25 of the League Covenant, and to offer it assistance.¹⁹

The International Federation of Students founded at Strasbourg in 1919 has from the first offered its cooperation in securing the success of the International University. National sections have brought the new institution to the attention of students in different countries. The Federation held its general assembly at Brussels on the 10th September and on the days afterwards. Delegations from twelve associations were present. Some of the discussion dealt with the International University the idea of which was received with great enthusiasm. It also passed a Declaration of University Youth full of optimism and faith in the movement of intellectual reconstruction from which the University derives.

Appendix III Note on the Organisation of Documentation

The first attempts to organise documentation internationally were made in 1895. At that time it was still only a question of bibliography. Until then the cataloguing of books, the inventorying of the sources of our knowledge in all matters, had not advanced beyond the national arena. In each country well-meaning authors, scientific societies, publishers and the National Library devoted themselves to these matters. There was no common plan, no agreement on methods, no assurance among them that the work would get done or be done in such a way as to respond to a whole range of needs.

In that year of 1895 the first International Conference on Bibliography met and founded the International Institute of Bibliography to continue its work. From its

inception, the founders of the Institute foresaw the need of having an official secretariat to develop a Universal Bibliographic Repertory and to keep it current by international cooperation. This notion was ahead of its time. It was first necessary to let the facts demonstrate the need for such a Repertory. This the Institute did.

After twenty-five years of work and of voluntary collaboration, the Repertory received its 12 millionth card on the occasion of the meeting of the 6th International Conference last September. Paralleling this, the Institute has undertaken other organisational work and, progressively, has developed a conceptualisation of the whole field of Documentation. The Conference has just reviewed all the work accomplished, and, hoping to see it continued and placed on a basis which will preserve it from the hazards of purely voluntary cooperation, took the following resolution:

"Considering the importance that documentation has attained in scientific and practical affairs, especially in the course of the War; considering the great achievement by voluntary cooperation that has occurred under the direction of the International Institute of Bibliography; but observing that it is now powerless to continue this work with the means currently available, *it is desirable that documentation, in particular the Universal Bibliographic Repertory, be entrusted to an international public agency*. It is the responsibility of the League of Nations, which is developing more and more as a collective organisation for the great common interests of all humanity, to take the initiative in setting up such an agency and to undertake for the statistical accounting of intellectual production, which is what Universal Bibliography is, what it has just done so happily for demographic and economic statistics."

The examination of these questions has been carried out in various reports.

It is useful first of all to distinguish the four degrees or forms of documentation: bibliography of titles, the collections of the works themselves or the library, abstracts of the works, and the documentary encyclopedia. A second distinction is based on the date of intellectual production: retrospective and current production. A third distinction leads to a difference in dealing with books and of periodicals. A fourth turns on the cooperation to be expected on the one hand between responsible national committees bringing together the intellectual organisations in each country (National Library, National Bibliography, scientific societies, etc.), and on the other the specialized international associations which cannot afford to neglect the documentation of their subject. A fifth distinction considers the organisation of documentary work, which eventually can be decentralised, as separate from the actual results of this work which it is important to have centralised as well as widely disseminated. Other distinctions involve the different times, places and subjects with which books deal as well as the form, manuscript or printed, that documentary activities can assume.

Voluntary national and international cooperation will certainly be continued, but for its full development it needs a powerfully equipped centre. It is proposed, therefore, to elevate the International Institute of Bibliography and Documentation to an International Bureau and to give it the following tasks:

1) To continue to coordinate all published bibliographic sources on cards in the Universal Bibliographic Repertory, and to do this with the shortest possible delay; included here are inventories of laws, statistical tables and patents which already have been the subject of partial compilations;

2) To proceed with the systematic collection of periodical publications, official publications and a selection of other printed material, which appear currently or

have appeared since 1900, in order to create a great International Library of the Twentieth Century. This is necessary for carrying out bibliographic work, and bibliographic work can only be fully useful if listed documents are made available immediately;

3) To collect systematically and continuously in a classified arrangement of dossiers, the most important information on contemporary questions in order gradually to assemble the materials for a vast documentary Encyclopedia. These files will contain brochures, reports, announcements, off-prints from journals, newspapers, books, etc. They will gradually form an "international dossier" on each question. Those who have documents will send them to be added to those dossiers or they will send simple notices whose contents they wish to make known. Completed by the cards of the Universal Bibliographic Repertory and supported by the International Library, these international dossiers should allow us at any time by means of a single consultation to gain as complete an idea as possible of the present status of any subject whatever;

4) By typewriting and photography (photostat), copies of the international dossiers or of particular items from them, or copies of bibliographic cards as well as textual extracts from works in the library, could be sent by return mail to any agency or individual worker who wants them. Eventually, documentary information could also be supplied by telephone or telegraph.

5) A clearly defined methodology involving editorial rules, model formats and an international universal classification will be developed and kept current. A plan for international cooperation on the basis of this methodology will be proposed. This plan will involve among other things the extension of the system of exchanges for periodical and official publications in order to make it speedier and more complete, the deposit in the International Library of a copy, obtained through national legal deposit, of commercially published books and, finally, an agreement to begin great documentary publications according to the monographic system of cards or loose leaves which permits the widest possible collaboration.

Thus will the International Union for Documentation be realized. It will be thought of as a federation of all national and special centres of documentation, whose autonomy it will preserve enabling them in the future to function as stations in a vast network of intellectual documentary communication.

The International Institute of Bibliography has begun largely to implement such a plan. But if these services are to develop and to have the regularity of operation that is desirable, it is necessary that they should become the function of an official bureau with ample resources at its disposal, commanding attention and cooperation because of the certainty that its work is unique and will continue.

It seems a simple matter for the League of Nations to acquiesce in this resolution and to take the initiative in calling a conference under its auspices to prepare a plan of organisation.

Editors' Notes

1. *Sur l'Organisation internationale du travail intellectuel à créer au sein de la Société des Nations: Rapport et voeu présentés par l'Union des Associations Internationales.* Novembre 1920. This is anonymous and without other bibliographical information except opposite the date, the number, P. No. 95. It should be ascribed to both Otlet and La Fontaine. The copy used for translation has an indecipherable pencil note in Otlet's hand at the head of the title on the cover "En communication avec prior de...?" the word "double [duplicate]". It was intended for distribution at the first Assembly of the League in November, 1920.
2. See notes 5, 6, 9, 11 and 12 below.
3. Of these establishments, the International University had just met for the first time, and the International Institute of Bibliography, the International Library (originally called the Collective Library of International Associations) and the International Museum were all, of course, creatures of Otlet and La Fontaine. Of the other establishments, some had come into being in what may be regarded as a preliminary form. There was at the time no International Office of Patents and Inventions, but the Bureau of the International Union for the Protection of Industrial Property had been set up in 1885 in Berne under the terms of an International Convention signed in Paris in 1883. There seems to have been no general Institute for Social Research either, but Otlet and La Fontaine had the Institut Solvay de Sociologie in Brussels to look to, and perhaps the International Institute of Sociology set up in Paris in 1893. The latter had a membership limited to 100 full members and 200 associates. It listed Woodrow Wilson as a Vice President in 1921. An international standards body was not developed until 1926 when the International Federation of National Standardizing Associations was set up. It was the forerunner of the present International Organisation for Standardization (ISO). There seem to have been few International Laboratories at the time Otlet and La Fontaine were writing. The Laboratoires Internationaux de Physiologie de Mont-Rose were founded in 1909. Member governments had the right of nominating one or two researchers to places in the laboratories according to the level of the government's subscriptions. The Université Libre de Bruxelles had three places reserved for its nominees. The Laboratories were concerned with all aspects of alpine research. It should perhaps be recalled here the Henri La Fontaine was a keen alpinist.

La Fontaine had made a case for the need for a wide range of organs of international life as early as 1894 in his "Organisation internationale et collective du travail intellectuel: Union Intellectuelle Internationale esquisse sommaire," *Bibliothèque internationale de l'Alliance scientifique universelle* fasc IV (1894), pp. 332-43. Apart from the International Library, International Office of Bibliography and a Central Service for International Congresses, La Fontaine had envisaged an International Statistical Office, International Councils of Teaching and of Hygiene, an International Office of Labour, an International Patent Office and an international service to deal with the nomenclature of science.

4. The International Financial Conference was to meet at Brussels on September 24 to October 8, 1920. See also Note 11 below.
5. The International Labour Conference was required by its Constitution to meet at least once annually, though in practice it tended to meet more frequently. The Conference comprised delegates representing governments, workers, and employers. The members of each delegation had the right to speak and to vote according to their own interests without restriction. This tripartite representation and the independence of each part was a novel and, for a time, controversial feature of the conferences.
6. The term "associé" is used in the context of Article 389 of the Treaty of Versailles. This, however, deals with the meetings of the Conference of Representatives of Members. On the other hand, Article 392, states that "the International Labour Office shall be established at the seat of the League of Nations as part of the Organisation of the League." Article 398 (supposing a simple error in transposing digits) states: "the International Labour Office shall be entitled to the assistance of the Secretary-General of the League of Nations in any matter in which it can be given." It is Article 427 in the Chapter of the Treaty on the ILO (Part XIII) that speaks of the machinery of the Office as "associated" with that of the League.
7. During the Council's meeting at St. Sebastian, July 30 to August 5, 1920, Léon Bourgeois presented a request from the Union of International Associations describing its plan for setting up an International University and asking for League patronage for the venture. After describing the plan, Bourgeois said: "Your Rapporteur recognizes the usefulness of the Union; he knows what great service it has rendered to private international associations; he knows the hard work which has enabled it to bring various projects to completion; he appreciates the lofty notions which inspired this proposal, but at the same time he cannot help remembering that this is the first experiment of this particular nature that has been attempted...." Bourgeois went on to indicate that it was impossible to judge who might attend as professors or students and concluded: "It would be premature, therefore, since the International University has not yet been created and has so far only received promises of co-operation to grant at this stage the patronage for which the Union of International Association's asks. Your rapporteur proposes ... to convey to the Union of International Associations the expression of our sympathy with the new work which it has undertaken, as well as our most sincere good wishes for its success..." (*League of Nations Official Journal*, 1920, pp. 305-6). See also Otlet's reference in Appendix II of this paper, "Note on the International University".
8. Otlet no doubt refers here to the International Federation of Trade Unions (IFTU) or Fédération Syndicale Internationale which was set up in 1901, assuming the name IFTU in 1913. Its constituent meeting after the War was held in August 1920, and the organisation was powerfully represented in the formation of the International Labour Office. After the Second World War it was replaced by the World Federation of Trade Unions. Otlet also refers here to two of the three agencies comprising the International Labour Organisation, the third, not mentioned, being the Governing Body.

9. The second conference of the International Labour Organisation was held at Genoa from June 15 to July 10, 1920 and adopted a convention providing for an unemployment indemnity, equivalent to full wages payable for a period up to two months, for seamen unable to find work after being wrecked at sea. Other conventions adopted on this occasion dealt with fixing a minimum wage for the employment of children at sea and with the provision of better facilities for finding employment for out of work seamen.

See note 6 above for article 392 of the Treaty of Versailles.

The functions of Treasurer, Recorder, and Registrar are set out in the Treaty in the following way: Article 399 states that the Secretary-General of the League of Nations will pay the expenses of the International Labour Office and the meetings of its Governing Body from the League's general funds and that the Director of the Office will be responsible to the Secretary-General for these funds. Article 405 states that copies of recommendations or draft conventions will be deposited with the Secretary-General for communication to national members of the ILO. Article 406 indicates that ratified conventions will be registered by the Secretary-General. The procedure to be used by the Secretary General to nominate members of Commissions of Enquiry to investigate complaints is set out in Article 412.

10. Article 23 paragraph (e) of the Covenant of the League of Nations provides that the members of the League "will make provision to secure and maintain freedom of communication and of transit and of equitable treatment for the commerce of all members of the League ..." The reference to Article 238 of the Treaty of Versailles is a misprint; that article deals with the restitution by Germany of cash and other objects seized by her. Articles 321 to 386 constitute Part XII, Ports, Waterways and Railways , of the Treaty. Article 328 deals with the maintenance of the free zones that existed in German ports as of August 1, 1914. It is probably this article to which Otlet refers.

Article 379 deals with the adherence of Germany to any general conventions "regarding the international regime of transit, waterways, ports or railways which may be concluded by the Allied and Associated Powers, with the Approval of the League of Nations within five years of the coming into force of the present Treaty."

The relationship of these and other articles in the Treaty (that is, Part XII) to Article 23 of the Covenant was recognized in a long report on "Transit, Ports, Waterways and Railways" by Quinones de Leon at the League Council meeting in London, February 13, 1920 in which he recommended the creation by the League of a special technical organisation to deal with the subject. He suggested that a Provisional Committee on Communications and Transport, already in existence in Paris, should become a provisional organisation of the League. The constitution of the Communication and Transit Organisation was formally adopted at the first Conference on Communication and Transit held in Genoa in March-April 1920. Here was adopted the General Convention on Freedom of Transit and the General Convention on the Regime of Waterways of International Concern. The second

conference in Geneva in 1923 adopted the General Convention on the International Regime of Waterways.

11. Called by the League Council at its meeting in London in February 1920, the International Financial Conference met some seven months later and recommended that the Council should appoint a committee to investigate forming a new international credit organisation. It also recommended the creation of a permanent organisation to follow up the work and recommendations of the conference. It suggested that the conference itself might meet again at a later date. At its meeting on 20-28 October 1920, the Council decided to propose to the League Assembly, which was to meet for the first time in November, 1920, that a Finance and Economic Committee be set up. This Committee was divided into two separate committees in 1927, though a single secretary, Sir Arthur Salter, served both.
12. Article 23(a) of the Covenant of the League, relating to the Special Chapter of the Peace Treaty that provided for the International Labour Organisation, states that the members of the League "will endeavour to secure and maintain fair and humane conditions of labour for men, women and children, both in their own countries and in all countries to which their commercial and industrial relations extend, and for that purpose to establish and maintain the necessary international organisation." It may not be Article 23(a) but article 23(f) that is being referred to in the text. Article 23(f) states that members of the League "will endeavour to take steps in matters of international concern for the prevention and control of disease."

Article 25 states: "Members of the League agree to encourage and promote the establishment and co-operation of duly authorized voluntary Red Cross organisations, having as purposes the improvement of health, the prevention of disease and the mitigation of suffering throughout the world." At its meeting in London in February 1920, the League Council requested that a Health Commission then meeting informally on the initiative of the British Government be increased in size and constitute a conference to make recommendations concerning the setting up of a permanent body in the light of articles 23(f) and 25 of the Covenant.

The International Health Office had been set up in Paris in 1908 to collect and distribute information received by the various health departments of member states. The Office agreed unofficially that it should be taken over by the League to become, in effect, an organisation similar to the International Labour Organisation. The American member of the Office refused to agree to this and the League Council proceeded to set up a separate League Health Committee to deal with various problems. This committee and its secretariat were known as the League Health Organisation. Otlet was writing when the future of a League Organisation for Health based on or closely related to the International Health Office seemed a forgone conclusion.

13. The problem of the spread of Typhus in Poland was one of the first social issues confronting the League. Responding to urgent appeals from Red Cross societies in Poland and following advice from the International Health Conference in London, the Council set up a Commission to report on the problem and instructed the

Secretary-General to ask League members to contribute a sum of £2,000,000 for its work. Only a twentieth of this sum was in fact raised and the Commission was able to improve the situation only marginally, and it deteriorated again in 1921. By the time the Health Organisation was created under the directorship of Ludwik Rajchman the problem has been contained partly as a result of energetic steps already taken by him.

14. At its meeting in Rome on 14-19 May, 1920, the League Council considered a recommendation prepared by the Secretary-General on the subject of traffic in women and children. Article 23(c) of the Covenant had entrusted the League with "the general supervision of the execution of agreements with regard to the traffic in women and children, and the traffic in opium and other dangerous drugs". The Council resolved to appoint to the Secretariat an officer whose duty would be to collect information relative to what was called the White Slave Traffic. This was taken up by the League Assembly at its first meeting in November, 1920, when it recommended that an Advisory Committee on the Traffic in Women and Children be set up.
15. Article 295 of the Treaty of Versailles made signatories party to an Opium Convention drawn up at the Hague in 1912 but not before brought into force. This article together with Article 23(c) of the Covenant gave the League from its inception a role to play in dealing with trade in opium and other narcotic drugs. An Advisory Committee on Traffic in Opium and Other Dangerous Drugs was set up by the decision of the first Assembly in 1920.
16. The problem of prisoners of war and of refugees from Russia and elsewhere in Eastern Europe, on appeals from Red Cross Societies led to the Council deciding to appoint a distinguished individual to investigate the problem, to study what governments and the International Committee of the Red Cross had so far been able to do and to advise the Council as to what action it might take. In April 1920, Fridtjof Nansen undertook the task. In two years with the help of the Red Cross he had arranged for the restoration of nearly half a million displaced persons to their homes. In 1921 the League Refugee Organisation was set up with Nansen as High Commissioner. He was known as the "Conscience of the League." For Article 25 of the Covenant see Note 12 above.
17. Reports of the Conference for the International University together with other material concerning its first meeting are to be found in *L'Université internationale: documents relatif à sa constitution*. Publication No. 1, Bruxelles: l'Université, 1920 and in Paul Otlet *Sur la création d'une Université internationale: rapport présenté à l'Union des Associations Internationales*. Publication No. 90; Bruxelles: UIA, 1920.
18. The pamphlet concludes with a 4th Annexe or appendix "The League of Nations and the Union of International Associations: Meeting of the Council of the League of Nations at St Sebastian". This reproduces the French text of the Council's resolution about the Union of International Associations and the English and French texts of Sir Eric Drummond's letter transmitting it to Otlet and La Fontaine. This appendix is not reproduced here. See also Note 7 above.

Léon Bourgeois, French representative to the League Council, was to recommend to the Council in 1922 that the League set up a Committee for International Intellectual Cooperation dashing all hopes of the League adopting the UIA for this purpose.

Sir Eric Drummond was first Secretary-General of the League.

19. Article 24 is the most important here (see note 12 above for the text of Article 25). It is as follows:

"1. There shall be placed under the direction of the League the international bureaux already established by general treaties if the parties to such treaties consent. All such international bureaux and all commissions for the regulation of matters of international interest hereafter constituted shall be placed under the direction of the League.

2. In all matters of international interest which are regulated by general conventions but which are not placed under the control of international bureaux or commissions, the Secretariat of the League shall, subject to the consent of the Council and if desired by the other parties, collect and distribute all relevant information and shall render any other assistance which may be necessary or desirable.

3. The Council may include as part of the expenses of the Secretariat the expense of any bureau or commission which is placed under the direction of the League."

14. THE INTERNATIONAL ORGANISATION OF BIBLIOGRAPHY AND DOCUMENTATION¹

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FIRST PART: FACTS, REQUIREMENTS, AIMS [1]

I. The Book, Information, Documentation

By *Book* is meant any gathering together of signs on a surface in order to capture and crystallize the results of investigation so that they can be understood, disseminated and preserved. By scholarly *Information* and data is meant elements of any kind, such as a fact, idea, or theory, which provide understanding and enlightenment for the intellect and guides for conduct and action. By *Documentation* is meant all of the means appropriate for the transmission, communication and dissemination of scholarly information and data (books, periodicals, newspapers, circulars, catalogues, etc.) - in a word, documents of all kinds containing texts or images.

Man has progressed from primitive barbarism with the help of signs enabling the abstraction and generalization of his thought. His language perfected, he invented writing and alphabets to set down his ideas in texts. The book was born, and with it progressively as civilization developed all the different kinds of documents gradually emerged. The book became to the mind what the tool, the machine, was to the hand: a veritable extension of the individual person. It intensified man's intellectual power in proportions as great as the machine, originating with the primitive tool, increased his physical power. Without the help of graphic documents to capture and give them permanence, understanding and impressions could only be fleeting, for *memory* alone is not enough to ensure the remembrance of them. They would also have only a limited reach, as *speech* is only one means of communication and takes place within a very restricted circle.

Thus, in a general way, one can say that documents of every kind, introduced centuries ago and still ceaselessly produced in every country, have registered and daily still register all that has been discovered, thought, imagined, planned. They constitute the means by which all of this has been transmitted from generation to generation and from place to place. As a whole Books and Documents form "the graphic memory of humanity," "the physical body of our knowledge," "the vehicle of thought," the written expression of civilization, the instrument for disseminating all progress; they constitute the liaison officer for all of the intellectual forces in the world.

[1] This account has been prepared for the Conference to be held at Brussels (7 September 1920) by the International Institute of Bibliography which is now celebrating the 25th anniversary of its foundation. It repeats and up-dates, facts and ideas set out in our earlier accounts. For various developments see Paul Otlet: *Les Problèmes internationaux et la guerre*, Paris, Rousseau, 1916 (2nd part, 3rd chapter: Intellectual Life); "Transformations dans l'appareil bibliographique des sciences," *Revue scientifique*, Paris, April 1918; "L'information et la documentation au service de l'industrie," *Bulletin de la Société d'encouragement à l'Industrie nationale*, Paris, 1 June, 1918; "Le Traitement de la littérature scientifique," *Revue générale des sciences*, Paris, September 1918, "La Société intellectuelle des nations," *Scientia*, Milan, January 1919; "L'Avenir du livre et de la bibliographie," *Bulletin de l'Institut International de Bibliographie*, 1911, pp. 275-297; "L'Organisation des travaux scientifiques" (volume des Conférences de l'Association française pour l'avancement des sciences, 1919); "Les Association française pour l'avancement des sciences," 1919; "Les Association internationales et le reconstruction," *Revue générale des sciences*, 28 February 1919; *Centre intellectuel mondial au service de la Société des Nations*, 1919, Publication No. 88 of the Union des Associations Internationales.

II. The Role of the Book and of Documentation

The role of the Book and Documentation is considerable. It is played out in the sciences, in their practical application, in education and in culture generally.

Science. The advancement of science is the result of an enormous collaboration. Workers in every country and in every specialty are involved in it. Science maintains itself as generations pass; it grows because it never ceases to develop; it is a patrimony that belongs to the collectivity of all because it is a common undertaking. Like economic activity, scientific work nowadays must become more socially responsible and more productive (*efficiency*) (*sic*). In order to have a value for society and to become part of general knowledge all scientific work must be given a written form, illustrated if possible, which reports the conclusions reached and describes the methodology which yielded them so that these results become communicable, objective and open to independent verification. This account must be brought to the attention of the scientific public by means of appropriate publication. A piece of research (observations, experiments, explanations) is valuable only if it is placed within the corpus of a science; that is to say, only if the research worker considers himself as a collaborator in general scientific work, obliged to be aware of the work of his predecessors and to be concerned with his successors.

The Application of Science, Technology. We have science (knowledge for the sake of understanding) and the application of science (knowledge as power and for social reform). Technology consists of making all possible applications of science, of submitting to the control and direction of science all that previously was a matter of experience. Science has thus a social function and has brought immense practical benefits to humanity: economic development, improvement of public health, prolongation of the average life span, comfort, a lessening of effort in work, and inventions of all sorts.

Every scientific truth has two values: first, an intrinsic, theoretic, disinterested value. This is linked to that satisfaction of curiosity and of higher intellectual life which the creation, transmission and acquisition of knowledge for the glory of human thought can bring (pure science). It also has a value of practical usefulness for what is needed in the lives of individuals and of society (applied science). Conversely, examining the facts of current practice according to the scientific method can help pure science develop considerably. Progress, therefore, rests on the parallel and simultaneous development of scientific knowledge, of its technical applications, and of the social action by which these applications are organised and become more general. This suggests the importance of documentation which serves as the intermediary between theory and practice. It is at the base of any action of consequence in the industrial, commercial, political and social arenas. But men of action, having little time at their disposal, must be able to obtain what they need immediately, easily and in an appropriate form.

Education. Documentation is involved in this from three points of view: a) how to reduce the delay between when discoveries are made and when they become part of the different levels of education; b) how to bring together oral teaching and teaching using books and to increase the distribution of knowledge by extending the role of reading in schools and colleges; c) how to co-operate in the process of self-instruction which not only occurs at an elementary level but is necessary for every person's eventual

improvement in his speciality. General education is *per force* incomplete. Special education (the teaching of trades and professions) is full of gaps. Both need books in order to keep up to date. The future will increasingly belong to men of initiative, to those who know how to develop their personalities and who themselves assume the duty of completing their own education. Whoever aims at success or wishes simply to live in a manner which satisfies his needs must have access to practical knowledge, to systems of education which are concerned with his situation and his profession, for they are the best fruits of centuries of cautious progress and collective apprenticeship.

III. Necessity for Organising Documentation.

Thousands of writings already exist and are produced daily. Millions of facts about reality and human understanding also exist. There are, moreover, billions of actions that must be taken by every great nation in the near future. When collected, how are the elements of our knowledge to be written down, to be transformed into appropriate publications and documents, and be incorporated rapidly into the great body of the sciences and the arts? How should they be brought to the notice of those who must act so that their action will be more useful, more extensive, in better accord with the action of others, better subordinated to more general goals - in a word, how can it become more efficient? At the time of the present paper crisis,² how can we best cater to the higher needs of knowledge and avoid useless wastage?

These questions can be resolved by creating appropriate "machinery." How this is to be constructed and made to function is the task of a Documentary Organisation. It is necessary that this Organisation be permanent and general. One cannot leave to chance or to transient and partial agreements what is needed to produce the benefits that derive only from services that are continuing, are regulated and have been established for the use of all.

The Book has its place in intellectual life beside Scientific Research and Education and it is now necessary to make this place more substantial. A century ago the greatest effort was made to organise education in a truly national way, drawing on an overview but at the same time embracing all levels of instruction and all parts of the country [2]. Recently there have been admirable attempts to achieve a rational organisation for scientific research (research grants, rationalization of laboratories, plans drawn up cooperatively, division of tasks, etc.). The Book must now be provided with an appropriate and comprehensive organisation. A great national, part public part co-operative, service must be set up for everything having to do with the preservation, circulation and use of the book.

[2] Compare, for example, the present organisation for education with that of the first plan for public instruction in France prepared by Bouquier.³

IV. Existing Organisations

Before the War the entire movement for the organisation of the Book and of Documentation was concentrated in four great international organisations: the International Conference of Bibliography and Documentation⁴, the International Convention for the Catalogue of Scientific Literature⁵, the International Congress of Librarians and Archivists⁶, and the International Congress of Publishers.⁷ Specialized congresses and conferences had also dealt with international exchanges and with the reproduction and lending of manuscripts. Sections of congresses devoted to other subjects had also touched on questions related to these matters and to the Book, such as the International Congress of Photography (photographs and films), of Geography (maps and drawings), of the Periodical and Daily Press (publication, circulation, preservation and indexing of newspapers and journals), of Administrative Sciences (official publications, administrative documentation and the role of papers in government departments), of Industrial Property (patents and industrial literature), and of Literary Property (copyright and legal deposit). A great number of scientific congresses have discussed the improvements needed in publication and the dissemination of information: the Congresses of Zoology, Botany, Physiology, Medicine, Lawyers, Engineers, etc. Finally, the World Congress of International Associations, a veritable congress of congresses, to which 136 international associations belonged in 1910 and 230 in 1913, devoted one of its six sections to Documentation, Publication and Bibliography. It adopted a remarkable body of recommendations which the International Institute of Bibliography had submitted to it and which recapitulated the work of most of the individual scientific congresses.

Created in 1895 by the first International Conference of Bibliography, this Institute has been the administrative and organising agency for the conferences which followed in 1897, 1900, 1907 [*sic* for 1908], and 1910. It is committed to becoming part of existing initiatives or to instigating them if necessary. Its work has had three parts: theory and methods, organisation, and performance of tasks.

The theoretical work has consisted in identifying and defining a body of ideas that illuminate the role of the Book and Documentation, in revealing desirable common objectives and modes of possible cooperation, and in promulgating standardised methods and elaborating these in detail. The *Acts* of the four international conferences and the twenty years of the Institute's *Bulletin* recount the steps in the development of the original idea. These have been summarized in two publications: The *Manual* of the Institute which appeared in 1904, and the *Code of Organization*, published in 1910.⁸ These comprise the tables of a universal bibliographic classification of subjects (the Decimal Classification), which has now reached 33,000 divisions with 40,000 terms in the alphabetic index, together with a body of principles, rules and recommendations, and notes on existing work and the resolutions of the conferences.

The organisational work has consisted in having these aims and methods adopted by a preliminary group of supporters and collaborators. As a result of continuous publicity, a thousand or so institutions, groups and individuals representing every country and every subject, have recognized the importance of the Institute's objectives and the appropriateness of the means proposed to achieve them. Taking into account the members of the associations that belong to the Institute, there exists a nucleus of several

tens of thousands of persons. To these must be added all the members of the public who have been introduced to the new methods by those libraries and offices, particularly numerous in the United States, which have employed them. The movement which in 1910 led to the great international organisations being brought together in a Union of International Associations, has been particularly important. The Union has adopted the programme of the International Institute of Bibliography, while the Institute has undertaken to provide documentary services to the Union and its members, and to become a constituent part of the World Centre set up in Brussels.

As for the tasks performed by the Institute, let us mention these facts: the Universal Bibliography Repertory on the eve of the War contained 11 million cards classified by author and subject. The Collective Library contained sixty specialized libraries belonging for the most part to international associations. The Documentary Archives consisted of about ten thousand files, which were being added to on a daily basis, of documents published on the great contemporary questions of science, technology and sociology. They contained, among other things, one hundred and fifty thousand photographic documents. The Institute has also participated in the International Museum, in which the International Associations, by means of an objective and graphic representation, have attempted to provide an over-view of the twentieth-century world.

V. Facts in the Realm of the Book.

Enormous institutions and immense undertakings have suggested to us what can be attempted in the realm of the Book. It is necessary that these achievements be constantly counter-posed to narrow views and to inertia. Let us list some facts. Before the War, some 150,000 book titles and 500,000 periodical articles were being added annually to a total previously estimated at more than 25 million titles, half of which were books. In thirty years, production had increased by 74% in the sciences and 215% in medicine; 400,000 works have been published since the 16th century on the single science, zoology, and more than 70,000 periodicals and newspapers of all kinds are regularly printed. There are more than 200 universities and 4,000 scientific societies at work throughout the world training the authors who will publish. Collaboration has led to improvements in major works, newspapers and reviews. There are works like the *Grande Encyclopédie Larousse* of more than 25,000 pages in length, or those regularly issued in new editions like *The Encyclopedia Britannica*, a work in its 11th edition bringing together more than 2,000 authors and collaborators under one editorial direction. There are the mass printers like the Government Printing Office in Washington where a battery of 150 monotype machines compose 12,000 characters an hour. There are the high speed printing establishments, like that of the *Petit journal*, printing one and a half million copies, with its Marinoni machines being able to fold, assemble and count 50,000 leaves in six colours an hour⁹; or that of the *Times* where a few men can carry out work which would have needed 300,000 copyists in a medieval scriptorium.¹⁰

The number of readers has tripled in half a century. The average per capita expenditure on reading has been assessed as 5 francs in France, 11 francs in England. There are powerful institutions, such as the International Institute for Agriculture in Rome,¹¹ the Patent Office in Berlin and the American Bureau of the Census, making

methodological progress by drawing out and using the considerable mass of facts embedded in documents.¹² There is the Book Fair in Leipzig with which more than 20,000 publishers, agents, and retail booksellers are affiliated, and which has just decided to build a special underground railway station in its basement for dispatching parcels of books.¹³

There are the giant libraries - the National Library in Paris, the British Museum in London, the Royal Library in Berlin, the Library of Congress in Washington, the New York Public Library, each of which contains more than 2 million volumes, whose buildings have cost up to 40 million and even 70 million francs (Washington and New York), and whose printed catalogues are monumental (Paris, London, Washington). There is the International Exchange Service of the Smithsonian Institution which has freely assisted in the distribution of official and learned publications in all countries.¹⁴ There is the *International Catalogue of Scientific Literature* whose 250 volumes, printed since 1900, contain more than 3 million references.¹⁵

All of these successfully completed and gigantic bibliographical enterprises and the remarkable machinery now put at the disposal of intellectual workers should encourage us to strive for something even better, bigger, and more highly co-ordinated in the future by bringing together all of these forces, institutions and collections.

VI. Science of the Book.

Such facts as these are not the only ones that can be brought to bear on objections which could be made against plans of organisation thought too vast. There is also the progress already made towards creating a true scientific corpus, the *Bibliographical sciences*, from all of our knowledge of books and documents. For a long time the term, Technology, has stood for a general discipline in which all the information related to each aspect of industrial production has been brought together. The terms Philology and Linguistics designate disciplines related to language that have become enormous because of their numerous ramifications. The same effort of systematisation and synthesis for books and documents, text and pictures, has been too much delayed.

Such an effort is necessary, however. The Science of the Book has followed the same historical process as all of the other sciences. In a first phase it was purely descriptive. *Bibliography*, properly speaking, appeared during this phase. A second phase must attempt to derive principles, laws and theories from the facts in order to create *Bibliology*. Finally, practical measures must be deduced from this as a substitute for earlier trial and error methods to give us *Bibliotechnology*. The discipline thus formed will encompass the whole of the vast field of the Book: its conception, the physical, graphic, and intellectual elements which comprise it, its various large classes and species, its evolution and transformations. It will deal with all of the books of the various periods, countries and branches of knowledge in order to determine better the relationship of form, structure, and trends. The theory of all the processes and functions of the book will be part of it: the author's work of composition, the work of printers and publishers, the work performed by libraries, and everything that bears on the use of what is printed and on reading. We need a general theory of the Book and the Document. It must be based on observation and comparison of existing specimens after the fashion of

natural history which describes and classifies species. It must stimulate the invention of new kinds of intellectual tools, just as industrial technology encourages the creation of new machines for transforming matter. In making clear the ultimate goals of the Book and its individual and social functions, this theory must also provide support and justification for a general organisation.

Already, bibliology has opened four chapters for study, and a statement about each of these is of great interest [3]:¹⁶

Scientific Bibliology. The improvement to which the book is susceptible when considered as an increasingly useful expression and crystallization of thought and knowledge. Conditions of the book in science.

Psychological Bibliology. The process of creation, circulation, use and influence of the Book and of the Newspaper. Research into the relationships created by means of printed matter between authors and readers. Research on the correspondence between the mental patterns of those who write and those who read; optimal conditions for individual reading; the appropriate role for text and pictures.

Sociological Bibliology. Diffusion of the book in the different classes of society; its role in the formation of popular opinion; how fundamental information about life and the conduct of society must be continuously disseminated throughout the body of society in order to ensure progress. The functions which, from this point of view, devolve onto the publications of official bodies and associations and onto newspapers.

Educational Bibliology. Intellectual preparation for reading and critical thinking; instruction of the young, continued among adults, as to the best methods for reading with profit; in higher education introduction to the written sources of knowledge. General theory of the use of printing in popularizing science, in propaganda for ideas and in the formation of public opinion.

VII. Proposed Goals for the Organisation

The Organisation for the Book will be guided by the following general goals:

a) to achieve complete accessibility of publications and documents with a minimum of time, effort, and cost. Consequently, to take appropriate steps to remedy the present state of affairs in which scholars have to deal with innumerable, incomplete, poorly kept-up-to-date, and insufficiently-organised sources of documentation. To permit these workers to find out exactly what is the state of our knowledge of the subject on which they desire information. To make sure that henceforth they will have no excuse for being unaware of what has been done before them or by their contemporaries. Thus to prevent intellectual resources from being wasted or unused.

b) To complete a systematic and complete registration of the information contained in publications, of all the data of a scientific kind. To do this in such a way as to facilitate its rapid assimilation by the reader, so that he is presented with a concentration of riches that are completely useful rather than with a conglomeration of materials whose mass makes them so much useless dross.

[3] Lectures followed by discussions organised on this subject in 1916 at Geneva by the Institut International de Bibliographie and the Institut Rousseau. They brought to public notice M. Nicolas Roubakine's remarkable work in Russia in the area of bibliological psychology (see Annales [sic for Archives] de Psychologie, Geneva, 1917).¹⁶

c) As for documentary works themselves which are produced by the systematic processing of publications after they are issued and which too often are undertaken without any overview - to simplify this work, to avoid duplication, to ensure continuity, to emphasize the ties between works and organisations, and to substitute order for chaos.

The Book is at the beginning and at the end of all research. At the beginning it makes use of what has been said and done by our predecessors and so makes use of all that our civilization has achieved. At the end of research, the conclusions reached, the opinions formed and the solutions proposed are presented in a new book. In our day scientific work has become inter-dependent. This interdependence exists between all of the sciences, between the sciences and all of their applications, between ideas and results both old and new, between work carried out in every corner of a country and that carried out abroad. It has steadily been transforming the conditions of intellectual, moral, economic, social and political life. Thus an immense interdependence has been established between all books. Documentation, though divided into sections for ease of organisation, cannot be divided separately in each case any longer. For Universal Civilization, Universal Documentation.

This commonality in intellectual endeavour, this discipline in work and thought, encourages a practical conception of documentary unification. Intellectually, indeed, it is possible to consider each publication, whatever its place of origin, its date, or the form it takes, as part of the vast body of science, as an element in a universal encyclopedia. Together all the libraries in the world form the ideal universal library. The Universal Bibliographic Repertory, an inventory and classification of books and articles, is the Catalogue of the Catalogues of all the Libraries, the general Table of Contents of publications, the Index of the Encyclopedia.

VIII. General Conditions Necessary for the Organisation

1. The organisation necessarily involves: a) a general plan of work and of interrelationships; b) a standard methodology permitting extensive division of work while enabling the consolidation of results; c) a governing authority which is able to obtain financial resources and has the authority to promulgate such rules and impose such measures as are deemed necessary; d) administrative organs; e) voluntary or obligatory agreements between all those who wish to cooperate in realising the proposed goals.

2. The whole organisation can only be international, inter-scientific (encyclopedic) and federative (an agreement between existing organisations).

3. The organisation has to meet the following three needs: a) intellectual workers should be certain of obtaining any published fact in the course of systematically conducted research; b) workers should be led from what is simple and summary to the complex and detailed; c) the repercussions of every new fact, of each new idea that could affect the status or our understanding of any branch of knowledge, should be swiftly noted at all levels of documentation.

4. The organisation should take into account two contradictory ideas: the totality and a selection. At the first level all documents, all elements of information are brought together: documentation will tend to be complete, universal, with nothing

excluded. At the second level a choice will be made: basic principles, established facts, new and original work, textbooks, standard works.

5. The organisation will have to take into account two different problems: a) how to take the products of intellectual labour as they exist and treat them in some complementary way that will add to their utility; b) how to influence this production itself so that from the outset the best methods are employed for achieving the organisation.

6. As for the utilization of the Book, the organisation must take the following distinctions into account: a) the object of research: the kind of problem (scientific, technical, social, etc.); the place involved (this or that country); the period when it was being considered (antiquity, historical or modern or recent times or the present); b) the way in which the book is used (for reading, consultation, ready reference, or for full documentation); c) the different classes of readers and researchers: scholars, businessmen, manual workers, women, children, etc.

7. The plan and methodology must take into account the different elements and points of view as follows: a) the various kinds of works and documents: books, periodicals, newspapers, loose sheets, prints, music, maps, photographs, etc.; b) the various sciences and kinds of activity to which the documents belong: the pure sciences, the applied sciences, the social sciences, philosophy, art, history, etc.; c) the various languages of publication; d) the countries where produced; e) the date of publication; f) places of deposit; g) the categories of publishers: individuals, commercial publishers, associations, official bodies; h) the various stages in the life of publications and the different operations and functions associated with them; i) the various establishments devoted to Books: Libraries, Offices of Documentation, and various administrative establishments and services.

8. The organisation must deal with publications from the moment of their production, and should follow the complete cycle of documentary procedures to which they are subject: a) writing (the work of authors); reproduction (the work of printers); c) distribution (publishers, book sellers, organisations for publicity, for free distribution or for exchange); d) cataloguing (bibliographic registration); e) preservation and communication (libraries, collections, legal deposit, loans); f) criticism (book reviews); g) abstracting and indexing; h) incorporation into the literary corpus of science (encyclopedias and general treatises, documentary dossiers); i) incorporation into the body of what is taught (programmes and courses at universities and special schools); use (reading, consultation, documentation).

9. After scientific publications have appeared they must then be processed in whatever ways are necessary for them to become widely known and used to the full. This processing essentially consists in linking each individual piece of work to the general work of science and ensuring that anyone who grapples with the latter must come across the former. Authors of publications, whose task is finished when they produce them, are not able to do this. It has to be done by organisations or special agencies, though authors can help if they will agree to make what they publish conform to a minimum number of regulation that have been drawn up to achieve this goal.

A comprehensive organisation therefore implies several stages to which various kinds of documentary work correspond.

1st stage: production of works - Ideas, experiments, new discoveries, etc. are registered in publications.

2nd stage: collection - Works are assembled in libraries and a totality is formed from all of the documents.

3rd stage: Cataloguing - Works are described, attention is drawn to their existence and to their location; existing collections are inventoried.

4th stage: Analysis - A summary of what each work contains individually is made.

5th stage: Systematic Redistribution - The publications are dissected and their various parts are physically redistributed in such a way that similar information is assembled in documentary files.

6th stage: Codification and the encyclopedia. Every work is a complex of facts and ideas incorporated in a certain bibliographical structure which is personal to each author who works according to his own plan. When the intellectual elements of the book are broken out and disaggregated, those that are original are re-distributed according to the standard categories of a general structure, the objective blueprint of the scientific edifice. The redistribution which occurs physically in the documentary files occurs intellectually in the Encyclopedia or in Codification and by the careful elimination of all unnecessary repetition.

SECOND PART: THE PLAN OF ORGANISATION

The plan of organisation by which the goals just described will be achieved successively involves: the implementations of a standard methodology, publications and their processing, the creation of collections and documentary works, co-operation, and managerial and executive bodies.

I. Standard Methodology

1. *There will be a standard method for documentation (standardization).* The aim of standardization is to permit continuity, connection, interchangeability, and cooperation, a close correlation between all aspects of documentation. The methodology must be able to offer intellectual workers everywhere a tool whose nature and use are perfectly familiar to them and which brings about the consistency necessary for those living in different countries, using different languages and sometimes working from the same documents with different purposes. Consequently, the methodology must be international and encyclopedic; it must be applicable to all forms of documentation. Approved by international congresses, it will be based on the most highly developed existing methods or on new methods which will have been recognized as superior. Its principles will be those stated hereafter.

2. *Consistency in collections and consistency in documentary organisations.* All kinds of document must be brought together into homogeneous collections which form systematic wholes provided with catalogues. The various collections are treated as parts of the same documentary organisation and the different organisations as so many stations in a single network.

3. *Bibliographic and documentary rules.* The entire cycle of each document's existence must be traced: birth, amalgamation with other documents of the same kind, subsequent development, utilization, destruction. At each of the stages in its evolution, a document has a necessary or better mode of being that it must develop towards and which it is important, therefore, to define and to achieve. Minimal rules and regulations organised into an international code will deal with the systematic registration of the various categories of information and the editing, publishing and dissemination of the different kinds of printed and manuscript documents. These rules and regulations must facilitate the processing of documents and their use, the formation of collections, and the development of the detailed work of cataloguing, bibliography, abstracting and codification to which documents must be subjected.

4. *Monographic format and cards.* Documents will be prepared in such a way that they can be organised into basic intellectual units that will be as small as possible (monographs). Moreover cards or loose sheets of a uniform size will be used, and each card, sheet or gathering of sheets will deal with a single intellectual element only. Scientific or technical publication is considered to be the creation of a gathering of these monographs which, having been isolated and reduced to the form of leaves or cards, can be amalgamated directly with similar elements from other books.

5. *Format of publications, documents and cards.* Standard formats will be defined: a) for publications and documents before the creation of collections: the standard book, journal, map, photograph, etc. (external formats with internal justified lines); b) for cards and sheets which are to be arranged in files and catalogues; c) for manuscript materials, principally administrative papers. The card format is 125 x 75 mm, the sheet format, 21 x 27.5 [cm].

6. *Classification.* Use will be made of a universal documentary subject classification, the divisions of which will be represented by a decimal notation. It will become an auxiliary classification when the simultaneous use of another classification is considered useful. Rules for alphabetic arrangement will complete this classification. The Decimal Classification adopted by the International Institute of Bibliography fulfils these requirements [4]. It will be related to the systematic and logical tables of a purely scientific character which have been created for each subject and which are constantly changing.

7. *Representation of scientific thought.* Various kinds of diagrams, graphs and outlines will be systematically used to facilitate understanding. General rules should be formulated for scientific illustration by means of documentary photography. Work will be undertaken to standardize scientific terminology and to create a system of scientific notation linking all individual systems into a universal system.

8. *Standardization of the storage equipment for collections (filing cabinets).* In order to reduce space and to meet the conditions of standardization and growth by frequent additions, a system of standardized documentary equipment will be used as "containers" for documentation (card drawers for the repertory, vertical filing cabinets for files, library shelves, display cases etc.)

9. *Documentary Repertoires and files.* By means of cards or loose sheets marked with classification numbers and arranged according to the order of these

[4] See the description of the classification in the publications of the Institute.

numbers, files and repertoires are created whose contents grow as a result of the addition of work from different sources that is incorporated into the one sequence by copying or cut-outs. The repertoires will be kept up to date by continuous additions and intercalations. In reality, they form books all of whose parts are indefinitely extensible and whose order can be re-arranged in any way thought desirable.

II. Publications and Publication Services, Publishing

10. *System of scholarly publications.* Each branch of knowledge and of practical activity should have a coordinated system of publications. These should cover the entirety of scholarly information. These publications will include original works and summaries of their results. Each system will comprise the following publications kept constantly up to date by new editions or by cumulations: 1) treatises setting out the facts in a systematic or alphabetic form; 2) periodicals publishing original work in the form of collections and keeping readers up to date about new developments, rather like newspapers; 3) bibliographies of the subject involving at once listing, indexing, reviewing and abstracting of publications; 4) general collections of documents or proceedings reproduced in full according to the originals; 5) descriptive catalogues of the objects of a science (these catalogues are different from bibliographical catalogues: for example, catalogues of vegetable and animal species); 6) state-of-the-art monographs about various aspects of a particular discipline and periodical reports on its progress; 7) histories of the discipline; 8) directories relating to its organisation (personnel, associations, teaching, research and documentation centres or institutes), etc.

11. *Control by scholarly associations.* The system of publication for each discipline will be controlled nationally by the competent national scientific association, and internationally by the international association representing the specialization. All of these associations, better and better organised into a vast "system of associations," will exercise great scientific and intellectual power in society by means of the Book.

Control will involve the following points: designating the basic kinds of publication; defining their essential structure; indicating the standard methodology to be applied to them from an external point of view and in relation to their general documentary function; ensuring that publications recognised as necessary are properly produced; for this purpose, dividing tasks between central offices operating under the direction of the scientific associations or between collaborators who have undertaken to carry out certain work; constantly supervising what is being done; regularly notifying scientific workers about works and publications that it would be useful or desirable to have undertaken; ensuring that all who need or would like to know about the publications have the means of doing so.

12. *The authority inherent in the system of publication.* The publications that are part of the system will supply writers with information which, given the state of knowledge at the time, will be considered to be a necessary minimum. No one wishing to do scholarly work will be able to remain unaware of these publications in relation to the subject he is proposing to deal with. On the other hand, no one should incur scholarly blame if he does not take into account what has appeared apart from these publications or has not been noted by them. Thus will cooperation be more effectively achieved and scholarly control exercised.

13. *Official and administrative publications.* Governments, parliaments, and regional and municipal authorities will ensure that all of their publications also form a system and are drawn up according to a comprehensive plan.

14. *Textbooks.* Textbooks at every level will form an encyclopedic collection, the foundation of a personal or family library for everyone who has been to School. A general introduction will note the relationships between these textbooks and general programmes of instruction. A consolidated table of contents will indicate their overall unity.

15. *Publishing rules.* A minimum number of general regulations will be applied to each publication belonging to the system of scholarly and administrative publications. These regulations will have a three-fold objective: a) to facilitate the reading of publications as they appear and for keeping up to date; b) to facilitate the subsequent research that will arise from particular works; for this purpose, the works should be provided with tables of contents, indexes and anything else that will promote the reliable and rapid creation of bibliographies, indexes and abstracts; c) to facilitate the comparison of works and the concentration of published information by means of extracts (copying or cut outs to form documentary files constituting a permanent encyclopedia). The physical, graphic and intellectual elements of scholarly publications will be standardized in all essential matters (format, typographic layout, tables, illustrations, symbols and diagrams, rules for the presentation of text, etc.).

16. *Subscription by libraries and governments.* The possibility of purchase of publications by libraries and offices of documentation will be used in such a way that these organisations will become the major subscribers to, and will assist in the publication of works recommended by, the scientific societies (cooperative publication). The resources at the disposal of academies, societies and learned bodies for encouraging publication and for providing financial support will thus be used in a more coordinated way. This will be true for government purchases and subscriptions as well. In these ways a reliable and cooperative basis will be found for the publication of books, periodicals, etc.

17. *Copyright.* The rights of authors with respect to the intellectual integrity of their works and to economic benefits from them, will be internationally protected. In the higher interests of science, education, and culture, measures will be taken to secure rights in the public domain.

18. *Re-publication of classics.* The Re-publication of classic works of science, literature, art and history (basic works of former periods) will be undertaken on a large scale by responsible national and international committees.

19. *Translation.* The most important works of universal thought will be translated into all languages becoming thus the international language.

20. *Printing and copying.* Systematic research will be undertaken in order to make use of and to improve all of the processes of reproduction: printing from type, black and white and colour photography, film, sound reproduction by means of the phonograph, projection, typing, and polygraphic copying.

21. *Preservation of works.* General arrangements will be made both at the time of printing and afterwards, to preserve intellectual works physically and to increase their durability (quality of paper and of inks, binding, etc.).

22. *Publishing and bookselling.* Publishing and bookselling will be organised locally, nationally, and on a world-wide basis in a way that will facilitate or accelerate the diffusion of books (central ordering, dispatching, and accounting offices; standardisation of procedures and conditions of sale and deposit, etc.). Such measures will make it easier for public collections to obtain non-commercial or privately published documents and documents which learned bodies have published (free distribution, sale, exchange). Regular relationships will be set up between commercial book trade organisations and the scientific organisations producing intellectual works.

23. *Government regulations.* Government should regulate in the most liberal sense everything concerning publication, notably censorship and postal rates as well as taxes and customs duties.

24. *Scholarly reviewing. Official reporting.* Scholarly reviewing will be organised on a regular basis and will be performed by competent reviewers with access to complete documentation. Commissions appointed by international associations will have the responsibility primarily of presenting official reports on the status of subjects. These reports will be referred to for information related to practical needs and for the best technical and social standards.

25. *Registration of scientific discoveries, inventions, and new data.* The international associations will arrange for direct and prompt registration by those concerned of all their discoveries, inventions, and publications.

26. *The relationship between the organisation of publications and the organisation of knowledge.* The Organisation of Publications (the printing of works) will become part of the General Organisation of Knowledge. Contacts will be created with its various aspects, especially research, collaboration, and the creation of scientific systems from what has been discovered.

III. Collections and Documentary Work

27. There will be a complete system of collections and documentary works comprising the following five branches: Libraries, Bibliography, the Encyclopedia, Archives and Museums. The standardised methodology will be applied to them, and their elements will be interdependent though each will preserve its own autonomy for separate development and use.

A. THE LIBRARY (COLLECTION OF BOOKS AND PUBLICATIONS)

28. Coordinated arrangements will ensure the systematic collection of all publications and will also facilitate access to them.

29. *Idea of the library.* Libraries will not be simple depositories but organised collections, created according to a plan, containing a full range of material with an up-to-date catalogue and easily accessible at all times. The internal organisation of libraries will be developed and improved. Libraries will no longer be limited simply to the preservation of books, but will be transformed into offices of documentation and laboratories for intellectual work. They will provide housing for the card catalogues necessitated by the new bibliographical apparatus of the sciences and they will institute the services required for these catalogues. They will have collections not only of books,

but also of all other kinds of documents, especially periodicals, newspapers, maps, photographs, etc.

30. *Kinds of library.* Each library will define its programme and role in relation to the following categories:

31. *The general system of libraries.* The system of libraries will be developed in a radial network proceeding from the periphery to the centre: a) Local libraries (municipal, village, school, postal, etc.); b) Regional libraries in large centres of population (University or multi-purpose); c) National Special Libraries devoted to the different branches of study (the libraries of the Grand Ecoles, institutes, associations, government departments); d) National Central Libraries comprising all that a country has published and a selection of the published output of foreign countries; e) Special International Libraries containing all that has been published in the various countries on a particular scientific specialty; f) a World Library created from all the libraries of the great international associations and containing the official publications of all countries. These libraries should be linked in such a way that they will constitute stations in a huge, universal network for the distribution of books analogous to the universal postal network for distributing the mails.

32. *Scholarly libraries.* Scholarly libraries will be organised like personal libraries. Works will not be lent externally except occasionally but will be consultable on the spot at any time. To cater to the needs of study at home and in public reading rooms, duplicates will be used to create collections for scholarly lending libraries.

33. *Private scholarly libraries.* Individuals will be encouraged to form collections of scholarly books. Such libraries create the stock that will become part of public collections some day by means of gift, bequest, or purchase. Individuals will become accustomed to sending books they no longer need to public collections.

34. *Non-Scholarly public libraries.* Educational and recreational reading and reading for current information by and large will take place in local public libraries of which there will be as great a number as possible. The holdings of these libraries will be constantly renewed and kept up-to-date. They will be part of the general documentary network but they will also form branches of the system of public education. Central lending depots will be organised either on an individual basis (a postal library permitting every inhabitant of a country to receive through the postal service works selected from an extensive catalogue) or on a general basis (circulating libraries deposited temporarily in a particular place).

Libraries are general or special, scholarly or non-scholarly, local, regional, national and international, of one kind or mixed (combining several types in the one organisation).

35. *Obligatory deposit of material.* Obligatory deposit of certain copies of works in libraries designated for this purpose will be organised in such a way as to ensure that they are preserved and listed. Steps will be taken to ensure deposit at the international level also, the costs of which will be offset by the publicity offered by Bibliography.

36. *International exchange.*

- a) Official bodies (parliaments, government departments, public establishments) and private organisations (learned societies and societies dealing with matters of public importance) will be kept in regular contact from country to country and within a particular country by means of a service ensuring the regular exchange of their publications.
- b) by means of exchange each country will hold all of the government publications and the publications of the learned societies of other countries. They must be centralised in one or more publicly accessible libraries.
- c) Shipments must be made regularly, rapidly, frequently and without cost to the partners in the exchange.
- d) A list of official and non-official publishers in each country must be issued along with a complete listing of their publications. This list will be drawn up in relation to the general bibliography of which it will become part.

37. *International loans.* The lending of works or documents between countries will be extended to all official libraries of the states and with the same conditions as govern interior loans but with an assurance of reciprocity and always without hampering the service of local libraries.

38. *Coordinated copying of rare documents.* An agreement will be reached for the reproduction by appropriate methods of manuscripts, books, and rare documents. The documents copied will be exchanged.

B. BIBLIOGRAPHY

39. *General conception and organisation.*

- a) Bibliography will be regarded as consisting of all the means by which rapid, reliable and full knowledge of the existence, contents and location of works is gained.
- b) Bibliography consists of: 1. lists or descriptive inventories of all separate publications as well as the articles and papers which make up periodicals and collective works (bibliography properly speaking); 2. the table of contents and detailed indexes of publications; 3. summaries, abstracts, critical surveys (annuals, abstracts, Zentralblatter, Jahresbericht); 4. catalogues of libraries or particular collections; 5. union catalogues involving all of the publications, or a special class of publications, held by a group of libraries; 6. collective biographies to some extent; 7. histories of literature and science; 8. chronological outlines of events prepared to facilitate access to sources; 9. systematic reading guides (select bibliographies, guides for self-learners).

c) the nature of each bibliography will be defined according to the categories just discussed; the scope of the contents will be defined according to whether they are regional, national or international; general or special; universal or individual; dealing with printed works, incunabula, manuscripts, archival material, prints, music or maps.

d) A general organisation should help eliminate duplicate work or works which do not form part of a general plan. It will strive to provide information more

rapidly, to disseminate it more widely, and to limit searching for it to a minimum number of catalogues and indexes. The principle underlying this organisation will encourage bibliographic standardisation.

40. *Universal Bibliographic Repertory.*

a) A Universal Bibliographic Repertory will consist of an inventory, arranged by subjects and authors, of books, periodicals and journal articles published in all countries, in all periods and on all subjects.

b) The Repertory will be created in the following way: 1) National Bibliography. Each nation will undertake to create, or have created, its own national bibliography or complete list of books published in its territory. It will make available to other nations copies of this bibliography which will be combined with the catalogue of the nation's national library (thus ensuring that the works listed are preserved). 2) International Bibliography. Each great international association will undertake to establish, or to have established under its control, eventually with the collaboration of the national associations of which it is a federation, a complete classified international bibliography of all publications appropriate to its objectives. This bibliography will involve the indexing of periodicals, and entries for works in national libraries will be included. 3) Special bibliographies. The preparation of separate bibliographies about special subjects by individuals, governments, or associations, will be encouraged. Care will be taken, however, to ensure that they are part of a general plan and go into greater detail for their subjects than national and international bibliographies can.

c) All bibliographic works will be compiled according to a minimum number of general rules which will allow them to be become constituent parts of the Universal Bibliography (contributions). This will itself be viewed as the union of the three kinds of individual bibliography listed above.

d) The Universal Bibliographic Repertory will take a threefold form: 1) a prototype universal repertory on cards held in the central headquarters of the organisation. It will contain manuscript entries specially prepared for it or entries derived from bibliographic publications. 2) Special bibliographies on particular subjects, prepared in a similar way, will be distributed wherever necessary. They will receive copies of entries from the prototype repertory to which they will add copies of entries that it does not have. 3) Publications devoted to a particular area of bibliography will be made available either in the form of printed cards which, in monthly or weekly shipments allow rapid dissemination of information, or in the form of volumes, fascicules or parts of periodicals. All bibliographic publications will be furnished with cumulative indexes and will be consolidated from time to time in general cumulated editions. e) Bibliographical listing and indexing should be directed first to modern and current works and, among all of the areas of knowledge, priority should be given to the pure sciences (mathematics, physics and the natural sciences), to the applied sciences (technology, industry, medicine) and to the social sciences (law, administration, political and social economy, commerce, education). These sciences are pre-eminently important for post war reconstruction.

41. *Bibliography of bibliographies.* A bibliography of bibliographies, or list of all the bibliographic works already published, will be compiled and kept up to date. It will be provided with all the annotations necessary to allow easy use of these works

during the period in which the Universal Bibliographic Repertory is being developed. These annotations will also facilitate the setting up of the prototype repertory and of individual repertoires by using the entries already printed in these sources.

42. *Indexes and Abstracts.*

a) Each group of sciences will have its own international indexing and abstracting service whose entries will be abbreviated or comprehensive depending on the importance of the works involved. This service will be part of special bibliography. Arranged by subject, it will ultimately consist of national sections, and its preparation and publication will be undertaken by authorized organisations in each country. These organisations will have to follow standard rules for indexing, abstracting, citing and printing (separate national fascicules which can be brought together in single international volumes with integrated indexes).

b) National indexing and abstracting publications will be prepared in the language of the country of publication, and abstracts in this language for major foreign works will be added in order to guard against national bias and to increase the knowledge of those not very familiar with foreign languages about what has been published. This national indexing and abstracting work will appear either as separate publications or as appendices, with separate pagination and printed separately, to periodicals on a particular subject. They will be used as the basis of the international service.

c) Authors will be asked to provide their own abstracts for their works which will be published with the works themselves. The abstracts should report findings and be accompanied by a translation into a widely used or an international language.

43. *Tables of scientific constants.* Tables of all data related to scientific and technical constants will be compiled, integrated and published.

44. *Library catalogues.* Each library will have a catalogue which will make all parts of its collections easily accessible to all kinds of readers. In principle, such a catalogue will have four parts corresponding to four kinds of entry: 1. authors; 2. classified arrangement according to subjects; 3. alphabetic subject arrangement; 4. inventory number order (basic collection and accessions).

The catalogue for the entire collection will be in card form. If a printed catalogue exists, the card catalogue will be confined to recent acquisitions and works listed in supplements. The catalogue will be related to, draw on and augment bibliographical sources which will in turn complement it insofar as the indexing of periodicals is concerned.

45. *Union catalogues.* General catalogues or special subject catalogues will be created in the form of location lists for works in a particular town, country or on a particular subject (union catalogue)[sic]. An International Union Catalogue will be combined with the Universal Bibliographic Repertory on the cards of which will be indicated, to the extent that this is possible, the location of rare and valuable works.

46. *Reading Guides.* In order to help obtain a general overview of scientific literature and literary works, reading guides will be published (select bibliographies, guides for independent learners). These guides will be established nationally and internationally as indicated above for indexes and abstracts, and like them there will be sections corresponding to the major divisions of knowledge. They will be related to

educational needs at every level. They will provide a link between scientific treatises and will be regarded as instruments for independent learning (The University of the Book).

47. *Bibliography and cataloguing in special areas.* Special measures should be taken for bibliography in certain areas:

a) *Law.* Classified abstracts of all the statutes in effect in the various countries, with references to preparatory studies for these laws, will be made along with an index of bills and proposals and summaries of important case-law.

b) *Patents.* The immense patent literature must be treated in an appropriate way. There should be announcements of all patents preceded by abstracts of them; collections of abstracts, classified catalogues.

c) *Natural Species.* A summary chart of all the chemical, mineralogical, botanical and zoological species with their names and synonyms and with references to the authors who first described and named them.

d) *Statistics.* Abstracts of existing statistics and of the tables in which they appear.

e) *Illustrations.* Catalogues of published illustrations of every kind: portraits, scenes, documentary photographs, drawings.

f) *Cartography.* Catalogues of maps.

g) *Manuscripts.* Catalogues and summary descriptions of manuscripts.

C. DOCUMENTARY ENCYCLOPEDIA

48. *Concept of the Encyclopedia.* Cooperative measures will be taken to create sequentially organised scientific files and dossiers to form the Documentary Encyclopedia, the third part of the general organisation of documentation. Publications individually contain only particular, incomplete, subjective statements. To the extent that they appear in periodicals the library assembles these statements in their original form and in the order of printing. It preserves them in a rough state without any of the improvements needed to bring out the relationships between them. The Universal Bibliography creates a link between them all and thus obviates the inconveniences arising from the fragmentation of knowledge and the dispersion of publications. It constitutes, so to speak, the catalogue of an ideal library which contains every work. In its indexing and abstracting form, it is like the table of contents (index of indexes) of a Universal Book in which each work is a chapter, each article a paragraph. But the responsibility for completing the documentary edifice is that of the Encyclopedia. Its goal is:

a) ultimately the dissection of documents themselves into their primary components and the redistribution of these as textual sources in standard categories; chapters, articles and illustrations extracted from books, journals and newspapers; pamphlets, off-prints, ephemera, photographs, etc. (materials for the Encyclopedia).

b) The systematic analysis of certain categories of data contained in publications as a whole in order to create comparative series according to a previously established plan. The direct registration of scientific facts and their independent publication so that they can be incorporated into these structures without any further adaptation.

49. *The Methodology of the Encyclopedia.* A standard methodology will be applied to the encyclopedia. Thus:

a) it will be established in the form of cards or leaves in repertoires or files in one or more sequences as appropriate and will be arranged by the bibliographic classification.

b) the encyclopedia for each science will also be placed under the direction of the International Association having that science as its objective.

c) the encyclopedia will be set up in prototype copies in a central institute designated for this purpose. In the first instance, its basis will be manuscript elements or elements that are unique without being limited by printing processes.

d) publications prepared according to standard rules will constantly add new facts to it and will facilitate its development. The system of publications for each area of science described above (No. 10) will therefore constitute the printed part of the Encyclopedia which will be the complement, the continuation, the permanent up-dating of the parts of these publications not yet printed. Particular international journals will be published according to these rules and will be kept current.

e) the Encyclopedia will be accessible while being prepared. Manuscript, typed, or photographic copies of it will be available on demand.

f) Documentary organisations will have encyclopedic repertoires limited to the subjects of particular interest to them. These repertoires will be derived from the prototype international repertory or created by the organisations themselves. In the latter case they will send copies of original materials to the central institution responsible for the prototype encyclopedia.

Created along these lines, the Encyclopedia will, therefore, have the following characteristics: it will have separate entries; it will be continuous, cooperative from the documentary point of view, illustrated, universal and international. It will recapitulate that product of science and of life which lies in books, and will set it forth in "documentary formats", that is to say, according to intellectual and physical arrangements which best meet recognized user needs.

Already important encyclopedic work and work of codification have been undertaken for laws, legal judgments, patents, statistics, technical constants, etc. The Encyclopedia by bringing together what is otherwise scattered, will have the effect of considerably shortening search time and of approximating this ideal: finding, at the price of a single consultation, all of the ideas related to a particular subject gathered together in a continuous way by the cooperation of all those who publish on this subject. At all historical periods there have been attempts to concentrate knowledge into great systematic and synthetical statements and, for this purpose, to prepare a comparative outline of science, history and human ideas - the works of Aristotle,¹⁷ Pliny,¹⁸ the summas of the Middle Ages,¹⁹ the *Encyclopédie* of the eighteenth century,²⁰ the great publications having this title in the nineteenth.²¹ Only the Documentary Encyclopedia, as it is defined here, can exercise an analogous function, for it alone is capable of dealing with the exigencies of the twentieth century. The term, Documentary Encyclopedia, has been adopted here because it makes clear the connection with the traditional concepts.

D. ARCHIVES (ADMINISTRATION)

50. *Concept of administrative archives.* The principles used to deal with printed scientific and technical documents will be broadly applied to internal administrative manuscript documents (administrative records, older archives). All the documents, all the papers from the same agency constitute a single documentary organism. These documents can be divided into the following two categories:

a) documents received from outside which have varying formats and dispositions. Some standardization is imposed on them by trimming, folding, indexing and labelling (subjects, origin, dates, etc.). Every effort will be made to get correspondents to adopt standard methods and to send only papers ready for filing.

b) Administrative papers created by an agency itself. Every effort will be made to have these papers conform immediately to the accepted rules. Such papers comprise: a) items of correspondence to be sent externally; b) items concerning internal matters intended for various departments and officials (minutes of meetings, instructions, departmental orders); c) items for facilitating control and which are needed only by the central office; d) items concerning objective studies for whatever purpose, of operations, objects, persons, places, etc. with which an agency is involved [5].

51. *Method.* The principles of a standard methodology are applicable here (classification, files, etc.). The general administrative repertory, established in a single sequence or in several partial sequences, will play the same role for administrative matters as the Documentary Encyclopedia for scientific matters. It will be based on the same idea: for each matter of business having to consult only one file or repertory where all useful information has been assembled according to already established categories. Thus, there will be a parallel between the centralising instruments of Study and Scientific Research on the one hand, and of Administration and Action on the other. In particular:

a) all possible information on an administrative matter will be collected and incorporated directly into the categories of the administrative repertory. This information, dealt with in a similar way in the various departments of a particular agency, will provide objective evidence deriving immediately from observation and experience.

b) Regulations will be codified daily (laws and decrees from superior authorities; instructions from within the agency itself). This codification will be helped by the use of the standard card and classification.

52. *General system.* Documentary standardisation will yield considerable benefits in the management of extensive or complex administrations. An attempt will be made to achieve organisational standardisation within all of the units of a particular

[5] The importance of documents in the internal relations of an organisation increases as the agency grows, and its sections increase in number and their interrelations become more precisely defined. A large government agency, a large bank, a large factory, like an army, are managed according to accepted general rules which are constantly modified. Any improvement introduced into one part (an office, a shop floor, a workshop, a combat unit) must be introduced immediately throughout. Only documents make this possible and controllable provided that they are themselves prepared in a flexible, rational way.

department in the same country and even in different countries in order to achieve economies of time and effort and to improve relations.

E. MUSEUMS (COLLECTION OF OBJECTS)

53. *Concept.* Collections of objects brought together for purposes of preservation, science and education are essentially documentary in character (Museums and Cabinets, collections of models, specimens and samples). These collections are created from items occurring in nature rather than being delineated or described in words; they are three dimensional documents.

54. *Method.* A great many principles and rules of documentation are applicable here: cataloguing, classification, standardization of specimens, labelling, methods of copying, etc.

55. *General system.* Attempts will be made to include collections of objects, to the extent that they are sources of information and study, in the general organisation for documentation. Cooperation in all its forms (documentary work, exchanges, division of labour, etc.) will be established between organisations having similar collections. A general catalogue of existing collections will be prepared by merging individual catalogues. Explanatory notes and illustrative charts (synoptic tables, diagrams, outlines, etc.) describing the collections of documentary objects will be organised as part of the Encyclopedia and will be set up in such a way as "to visualize" and synthesize what is known. Systematic efforts will be made on the basis of a master plan to reproduce photographically the specific models used for natural history descriptions as well as works of art and historically valuable objects preserved in museums. These photographs, as well as others having a documentary character, will form part of a Universal Iconography.

IV. Cooperation and Agencies of Cooperation

56. *General principles.* A systematic body of regulations will ensure cooperation and coordination between all the forces working for the development of the Book or which are involved in Documentation. An organisation (General Union for Documentation) will keep documentary organisations (members) in contact with one another. It will link them to an executive body (Central Institute) by means of a system of agreements and will ensure their representation in a Congress having all the necessary authority. The organisation will be a federation in which the autonomy of its members will be respected; it will be mixed, bringing together non-governmental and governmental organisations. It will achieve coordination in a two fold way: geographic place and subject specialty. It will create concentrations and relationships at various degrees or levels. It will use what exists as much as possible, but will also proceed by fusion, elimination, and creation (amalgamation and re-organisation). It will take advantage of the best organisational experience, especially that of international organisations.

57. *Network of documentary organisations.* Documentary organisations (libraries, documentary offices or bureaux), whether autonomous or part of existing bodies, will function by means of documents as stations in a vast network of intellectual relations. They will provide for the wants of intellectual workers according to their needs. The network will cover all countries and all areas of knowledge and practical activity. A documentary organisation will comprise as necessary all or only some of the various services and collections defined above (library, bibliography, encyclopedia, etc.). The organisations will support each other; they will cooperate with each other (an intellectual cooperative). Any worker will be able to have recourse to any one of them to act as his mediator in relationships with all of the others. Regular contacts will, therefore, be set up between all existing centres to permit them to make use of their resources, to make exchanges, to undertake common projects, to contribute to the central collections, to achieve agreement on the best applications of common methods, and on standardization and selection of documents.

58. *Different degrees of organisation.* There should be six degrees or levels in the organisation.

First level: The individual worker, the producer or user of documents. He will strive to relate his personal documentation to general documentation. He will make use of the latter, but will also cooperate with it. He will immediately join the local organisation through which he can have access to the resources of all of the other organisations.

Second Level: Local and regional organisations. These will bring together into groups or federations all local or regional organisations, particularly those which act as sections of national organisations. Factory offices must be linked to offices of documentation in their specialty in order to obtain help and cooperation so that they can dispense with general work and concentrate on more specialized analysis.

Third level: National Special organisations. These will group by specialization bureaux of information and documentation, great industrial and commercial enterprises and government departments. They will have local and regional sections as described above (second level) and will themselves be affiliated to international organisations in their specialty (fourth level [*sic* for fifth level]).

Fourth Level: General National Organisations. These will group each country's organisations at the third level into a single federation. Their action should extend down as far as local organisations (second level) and as far up as the universal organisation (sixth level). The National Library of each country should be the centre for national documentary collections.

Fifth level: Special International Organisations. These will be represented by international associations for each specialty, which will have to create services or offices of documentation to which centres for international publication and special international libraries will be attached, as has been explained.

Sixth level: The Universal Organisation. This will simultaneously link national organisations (fourth level) and international organisations (fifth level). In this way it will cover the whole field of documentation.

59. *International Union for Documentation.* All of the members of the organisations just described together will create a great Union whose organs will be as follows:

- a) An International Convention to which states will belong (representing their great official agencies: academies, universities, national libraries, etc.); nongovernmental documentary organisations at the national level; international associations; and the League of Nations.
- b) An International Council, composed of delegates from the interested parties and represented by a Permanent Bureau, will administer the Union.
- c) A Central Institute will serve as an executive organ having to study, negotiate, centralise, coordinate and note all useful regulations in agreement with the interested parties. It will draw up a detailed plan of cooperation, standard methods and the division of tasks. It will serve as mediator for all affiliated organisations. It will develop universal collections by centralising or duplicating individual works and will put them at the disposal of interested parties. It will be divided into sections by countries, branches of knowledge, and categories of documentary work (International Institute of Bibliography and Documentation).
- d) An International Congress, an unrestricted, deliberative assembly, will meet periodically. All national or international organisations having the Book as their object or as an interest will be represented in it. The Congress, divided into sections like the Institute, will act as an organ of study, organisation, and consultation for the Union and will take whatever initiatives are useful for the Union.

60. *General cooperation.* In the organisation thus defined there is a task for everyone: governments, municipalities, government departments, academies, universities, learned societies, international associations of all kinds, publishers and booksellers, authors and intellectual workers. Each will strive to act according to the principles of organisation that have been adopted and to use the services and collections created for the benefit of all.

61. *Popularization, education, Science of the Book, statistics, permanent Yearbook.*

- a) Ideas about documentation, sources of information, and documentary methods will be disseminated widely to scientific workers and the general public; they will inform teaching at every level.
- b) In order to train the personnel required for the various kinds of documentary work, special education at different levels, including the university degree, will be introduced.
- c) Efforts will be made to form our knowledge about the book (bibliology) into a separate science. This science will lift practical applications beyond empiricism (bibliotechnology); it will offer guidelines for developing a complete sequence of "documentary formats", from the separate document up to the complexities of large collections, through which scientific information can flow. It will also provide the basis and organisational rationale for documentation and for the reforms which result from it.

62. d) The scattered and uncoordinated elements of statistics concerning the book will be brought together, completed, kept up-to-date and published in such a way that comparisons can be made and totals arrived at.

- e) A general Yearbook of Bibliography and Documentation listing all the organisations, collections and services related to the Book and Documentation, will be published at frequent intervals.

Editor's Notes

1. *L'Organisation internationale de la bibliographie et de la documentation.* Publication No. 128; Bruxelles: IIB, 1920. 40pp. This paper repeats almost verbatim substantial portions of Otlet's "L'Organisation des travaux scientifique," an address given in Paris, 25 February 1919 and published in *Volumes des conférences, 1918-1920* of the Association française pour l'Avancement des Sciences (Paris: L'Association, 1919, pp. 15-50) to which he refers in his first footnote.

I have prepared a "Table of Contents" for this paper because it gives a clear overview of the detail of the whole "documentary" area with which Otlet is concerned. The way in which this paper is organised, a series of small, separate numbered sections, represents an application of the "monographic principle" by which separate items of information are "separately" recorded for ease of subsequent "partitioning". The overview presented in this paper is more fully developed schematically in "La Systématique de la Documentation" of 1932 and in its fullest, substantive form in the *Traité de Documentation*, 1934.

2. Before the war, Belgium was a major international supplier of paper (Britain imported 20,000 tons a year from her, for example). After the war supplies were short, chemicals used by the manufacturers of paper were becoming increasingly expensive and methods of payment to suppliers had been changed. In 1920, a London correspondent, in an article headed, "European Paper Manufacturers Face Critical Problems," observed that "meanwhile paper continues to get dearer and dearer, and with the progress of peace there does not appear to be a way to make paper more approachable to the urgent buyers for most legitimate purposes." (Thomas Reece in *Paper*, August 4, 1920).
3. Gabriel Bouquier, about 1750-1811, attended the convention in Paris in 1793-94 as a representative from the Dordogne. His single claim to fame was his presentation as a member of the Committee on Public Instruction of an educational plan of a singularly limited kind. He wanted to proscribe forever the formation of academic bodies, scientific societies, even educational systems. In his view the best instruction took place in committees, and the Revolution, in setting up popular societies and clubs more or less by chance throughout France, thus provided "inexhaustible sources of instruction". We must not, he said, "replace this organisation, as simple and sublime as the people who created it, with a factitious organisation based on academic statutes which must infect our regenerated nation no more". Compayre, "Histoire critique des doctrines de l'éducation en France", t.II, p. 350.
4. These organisations, save for the third, are too well known to warrant much by way of a note here. They are dealt with in various places in the text. The International Conference of Bibliography and Documentation derived from the meeting in 1895

- that led to the foundation of the 11B. The conference met in 1897, 1900, 1908 (when the word documentation was added to the name), 1910 and in 1920.
5. The International Convention for the Catalogue of Scientific Literature was the international body brought into existence at the initiative of the Royal Society of London to prepare the *International Catalogue*, the twentieth century successor of the Royal Society's own *Catalogue of Scientific Papers*, which was limited to the nineteenth century. The Convention met first in 1900, then in 1905, 1910, 1914 and 1920 in London, and, finally, in Brussels in 1922.
 6. The International Congress of Librarians and Archivists is interesting. Though one may argue that its origins go back to the 1877 International Conference of Librarians in London, the Congress actually met for the first time in Brussels in 1910 when it was organised by a Permanent Commission which was also responsible for publishing its proceedings in a substantial volume. Avowedly permanent, the commission was heard of no more.
 7. The International Congress of Publishers was founded in 1896. A permanent bureau for it was set up in Berne under Henri Morel (see editor's note 2 to Paper 7, "The Reform of National Bibliographies...", in this volume).
 8. The *Bulletin* of the 11B appeared from 1895 to 1911, was not issued during 1912-1913 and re-appeared briefly in 1914. A few isolated issues appeared in the decade 1920 - 1929. The *Manuel* is a difficult document from a bibliographical point of view. Of enormous proportions, each copy is numbered and the publication dates run 1904 to 1907, (see note 7 to paper 7, The Reform of National Bibliographies..., in this volume). The Code of Organisation is also curious. The main document was called "General Code for the Organisation of Bibliography and Documentation," a draft of which first appeared in 1908. Three other "codes" developed sections or chapters of the main code: "Code for the Organisation of the Periodical Press," "Code for the Organisation of Administrative Documentation," and "Code for the Organisation of Photographic Documentation." These documents were submitted to appropriate conferences that were held on the occasion of the 1910 Universal Exhibition at Brussels, conferences in the organisation of which Otlet played a major role. The codes were published in the *11B Bulletin* 12 (1910).
 9. The *Petit journal* was an early example of a mass circulation newspaper. It was founded in 1863, issues sold for 1 sou. The journal ceased in 1944. August Hippolyte Marinoni was born in 1823. At the age of 21 he constructed a machine to fold newspapers. In 1872 he invented a special rotary press for the *Petit journal* capable of printing 40,000 copies an hour. The *Grand Encyclopédie* describes his "polychromatic printing machines for illustrated newspapers" as producing "20,000 copies in six colours an hour." Marinoni became director of the *Petit Journal*, in which he was the major shareholder, in 1883.
 10. Improvements in the rotary presses used for newspaper production are discussed in *The Times Book of Printing*, a collection of a series of articles first published in *The Times* in 1919. In the article, "Newspaper Presses: Increased Speed and Output," it is noted that the hand press was capable of about 250 impressions an hour, while "The

'Goliath' rotary presses in use today [are] capable of producing over 300,000 copies an hour..." (p.182).

11. The International Institute for Agriculture was created in Rome in 1905 largely on the initiative of a Polish-born American, David Lubin. An organisation of states, it flourished before the first world war. It was absorbed into the United Nations Food and Agriculture Organisation in 1947. Otlet was invited to study its documentation services in 1911 and again in 1920. His reports on these consultancies are listed in the *Bibliography of the Work of Paul Otlet* at the end of this volume. Otlet uses it as an example of a specialised documentary organisation pointing the way to the future in his "Traitement de la littérature scientifique", *Revue générale des sciences*, 1918.
12. Berlin was designated seat of the German Patent Office (Reichspatentamt) in 1871. Part of the Office was a library or documentation centre (Bucherei der Patentampts). At the end of the war, the Office had grown to enormous proportions, occupying a building of 23,600 square metres on the Gitschnerstrasse.
Otlet may also be referring here to the use of Hollerith machines and punched cards at the U.S. Bureau of the Census, to which he refers also in Paper No. 12, "Transformations in the Bibliographical Apparatus of the Sciences" in this volume (see Editor's note 7).
13. The idea was first raised around 1916 to expand the delivery facilities at the Book Fair by creating a special railway and post office. The War led to this being dropped.
14. The Smithsonian Institution was established by Act of Congress in 1846. The system of international exchanges was begun as a way to distribute its publications. In 1867 Congress charged the Smithsonian Institution with the task of exchanging 50 copies of all U.S. Government documents for similar works published in foreign countries. In 1886 a formal International Convention for International Exchanges of Official Documents and Scientific and Literary Publications was signed. This was officially proclaimed in the U.S. in 1889 and the Smithsonian Institution was recognised as the official exchange agency in the U.S. It has had and continues to have a long and distinguished history as one of the world's major exchange agencies.
15. For the *International Catalogue of Scientific Literature* see Editor's Note 2 to paper number 12, "Transformations in the bibliographical apparatus of the sciences" and Note 5 above.
16. Nicolas Roubakine, 1862-1946, was a prolific Russian populariser whose sympathy with the revolutionary movement in Russia led him to seek exile in 1904 in Switzerland. His studies of self-education, reader's needs, psychology and language lead to a number of treatises and text books. In 1916 he lectured at the Jean Jacques Rousseau Institute in Geneva on his theories of bibliopsychology. Otlet and Swiss members of the IIB were present and subsequently a Section on Bibliopsychology was created in the IIB with its office in Roubakine's library in Lausanne(Ferrière, "La Psychologie bibliologique d'après...Nicolas Roubakine").
17. Aristotle, 384-322 B.C., produced an enormous corpus of work of which only his philosophical and scientific treatises have survived. They fall into these categories:

logic, physics, psychology, natural history and philosophy. They are encyclopedic in scope and treatment and encompass, as Aristotle expounds his own ideas, the knowledge and beliefs of the Greek world of his time. In addition is a record of over two hundred title of other works, with one or two exceptions, all lost. Presumably prepared with the help of students and others, these were essentially compilations of historical records and other research materials.

18. Pliny the Elder, A.D. 23-79, wrote or compiled a number of histories and other works. Only his *Historia naturalis* survives. He claimed to have sifted through the writings of 146 Latin and 327 non-Latin authors to find 20,000 items of information, though modern estimates are much higher (Stecchini, "Encyclopedias in Time and Space").
19. For a brief comment on "Summas" see Note 14 to Paper 1, "Something About Bibliography" in this volume.
20. The *Encyclopédie ou Dictionnaire raisonné des sciences, des arts et des métiers* edited by Diderot and D'Alembert appeared in 28 volumes from 1751 to 1752. It attracted much political controversy. It is accepted as a key work in the French Enlightenment and as having helped to pave the way intellectually for the French Revolution.
21. Among the great 19th Century encyclopedias one would have to include *Encyclopaedia Britannica*, though the first edition was completed in 1771. Subsequent editions up to the 9th edition appeared in the century. Other encyclopedias to which Otlet may have been referring are: *Encyclopedia Americana* (first edition 1829), Brokhaus's *Conversations-Lexicon*, Larousse's *Grand Dictionnaire universel du XIX siècle*, 1886-1890 (see footnotes 6 and 7 in Paper 1, "Something About Bibliography" in this volume), *La Grande Encyclopédie*, the Dutch Winkler Prins' *Encyclopedie* as it is now called, Meyer's *Der Grosse Conversations Lexicon* and the incomplete *Allgemeine Encyclopädie* of Ersch and Gruber.

15. THE PRESERVATION AND INTERNATIONAL DIFFUSION OF THOUGHT

THE MICROPHOTIC BOOK¹

The Problem

The basis of scientific and technical work is documentation. By means of offices of bibliography and card systems, it is possible nowadays for anyone interested in a particular subject to get documentation on everything that appears anywhere in the world on that subject. Immense progress in intellectual work has been achieved in this way. Difficulties, however, only seriously begin for the researcher when he has assembled all his bibliographic information. Because of the quantity, the dispersion and increasing price of books, newspapers and technical journals, it is hardly possible now for an individual to acquire them with any regularity, even if he confines himself to the most important.

Purchase of the issues of various periodicals containing articles that the cards refer to is certainly a less burdensome solution. It requires readers, however, to enter into a complicated correspondence and publishers to preserve and subsequently to break up complete sets. As the number of copies in stock is necessarily limited and as issues go out of print in an irregular way, publishers often find it impossible to anticipate demand.

A last means of obtaining documentation remains - going to consult a work in the nearest library. Alas! Not everyone can do this. Moreover, it involves a considerable loss of time, occasionally a difficult journey, the risk of finding the work one wants in use, and the trouble of having to make a copy of the parts of the text one wants to keep.

Like the scholar, the inventor also finds himself in a particularly troublesome situation, for, as documentation exists now, he can find out about the antecedent of patents which are of interest to him only with the greatest difficulty. The establishment of a central International Patents Office, the principle of which has been accepted by the League of Nations, makes even more urgent the introduction of swift methods for facilitating documentation in this area.

The Solution

As early as 1906² we proposed that the book or documents generally should be given a new form, that of the miniature "volumen"³ as follows: each page, element, or combination of pages is photographed directly on a "frame" or film of the standard motion picture format. The images thus obtained, reduced to 18 x 24mm in dimension,

appear successively side by side on the strip of film. This virtual image reproduces the smallest details of manuscript or printed text as well as illustrations.

The negative is used as an original or prototype from which positives of the same dimension can be made. Reading the positives requires either a magnifying glass or a simple little projection lamp or "reading machine" which has been especially constructed and which is so small that it is pocket size.⁴

As this equipment is now, the new method permits the filming of one hundred pages of a book that is to be copied in two hundred seconds. In an hour several thousand pages can therefore be copied by a single piece of equipment and at a moderate price. When each book is put on a separate roll of film and placed in its own box, a piece of furniture (microphotolibrary) comprising ten drawers a metre in area and a tenth of a metre in height, can hold 18,750 microphotographic volumes of 350 pages. this is the equivalent of a library whose shelves end to end would measure 468 metres.

Positive copies on film intended for reading can be obtained by simple contact printing by means of special machines with a capacity of up to 1,000 metres an hour, or 52,000 pages. Copies can also be obtained in the form of composite negatives whose elements are extracted from the continuous negatives.

The film prints are placed in the "reading machine" which reconstitutes the text or the graphic document to its true size. Thus any arrangement can be given to the separate exposures, or a selection limited to several exposures can be made, or new exposures can be intercalated (for revised or cumulated editions).

The apparatus provides for viewing either by vertical projection from above down to any opaque white surface placed on a table, or by means of a transparency by reversing the apparatus in such a way that projection occurs from below upwards. In this case, the white surface is replaced by a transparent support such as frosted glass or tracing paper. When the machine is set up horizontally, projection can occur on a wall or on a screen. In this way simultaneous viewing by a great many people is possible (lectures, schools, scientific demonstrations, etc.).

If preservation of an enlarged document is desired, the screen is replaced by a sheet of sensitized silver bromide paper and, after development, a reproduction is obtained of the wanted size depending on the reader's keenness of vision. If a small number of copies of the whole document is needed, a special machine allows for the continuous printing of the enlarged image on sensitized paper. If an extremely large number of copies is wanted, a continuous printing process using printer's ink allows as many copies as required to be reproduced very rapidly.

Applications

For practical purposes a negative and a positive reel of film for each volume or series of documents are kept in a central office. Each reel can be used to make an unlimited number of copies.

The reels of positive film can be read in reading machines in the office itself or sent out on loan or offered for sale. Reproductions in the format, quantity and on the material requested (film or sensitized paper) can be sent on demand to those interested. A very simple method allows the wanted film and the part of it that is of interest to be

rapidly retrieved. Thus might documentation, which is now confined to providing the titles of works, easily be improved by providing actual texts as well.

1. This method seems particularly suitable for *Bibliography* itself. It is easily possible to reproduce 1,248 cards on a metre of film and thus to obtain reels of film which represent continuous catalogue drawers that have no limit. One would be able to become informed of the progress and development of a subject simply by consulting successive reels of film created at different periods.

2. As for the special subject of *patents*, it would be possible to preserve very cheaply and also to make excellent copies of not only published patents but others which exist only in their original form, and to keep the film up to date. For patents which are not printed, such as Belgian patents, for example, it is especially important to have not only a rapid and economic method of copying, but one giving every guarantee of accuracy.⁵ A special organisation would encourage the world's various patent offices to send their patents or copies of them on film to the central office where their preservation, their arrangement by subject and their distribution would be assured.

3. It is also possible to conceive of a central office for *Periodicals*. It should be possible to make regularly photographed periodicals available to all without injury to publishers. They would receive a royalty for each copy sold by the central office which would in a sense be creating a special kind of edition for them. Publishers would be relieved of the problem of obtaining individual issues by breaking up their sets.

4. The proposed system would permit the cheap re-issue with their illustrations, plates and engravings of *rare or out-of-print books*, especially classical works in their original form and documents for the history of science. It would also make possible the creation of libraries in new countries, the rapid reconstruction of libraries destroyed by accidents, acts of war or catastrophes (Louvain, Tokyo)⁶ and the setting up of international libraries, true universal repositories of thought, an ideal to the realization of which the Union of International Associations and the League of Nations Committee on Intellectual Cooperation are committed. The system would also permit the effective publication of books without having to go through the costly intermediate process of printing. In this context it is a matter of considering the increasing number of scientific publications of which only a limited number of copies are needed and which, therefore, cannot justify the heavy cost of printing. This is especially so with theses, special atlases, the communications of learned societies and certain catalogues. All that is necessary in these cases is to use a type-writer and ordinary photographs or sketches to illustrate the texts. The original edition would be made up of "microphotos" and one would have returned - assuredly a curious reversion - to the primitive format of the book: a new kind of *volumen*, the "*micro-volumen*".

5. There are innumerable applications in the *fine arts*. In all major centres are to be found treasures in the form of drawings, prints, engravings, paintings, graphic documents of every kind, unpublished items or items printed in very few copies or that have become unique with the passage of time. It would be easy to establish agreements for the exchange of films between these different centres, and, on the occasion of each exchange, to deposit an original copy in the central office. For example, reproductions of paintings by Rubens that are now scattered in Vienna, Paris, Rome and Brussels could be put onto a single roll of film made up from different films deposited in the general central office by local offices in these cities.

6. The same method is applicable to *Music*. Musical scores are scattered in a great many places which are relatively inaccessible. Typographic reproduction of them is almost impossible. This system would permit the reproduction of musical selections.

7. Applications to *Education* would also be very numerous because the system allows the distribution of film. Films containing fifty exposures a metre are already being supplied to educational establishments at a very low price. They are inexpensively superseding glass negatives which, apart from having become extremely costly, are awkward, fragile and heavy to transport. The reading machine is used for wall projection to any degree of enlargement. It uses the electric current of a city, regardless of its voltage, or if there is none, that provided by small batteries. Every educational institution henceforth can be inexpensively equipped with its own projection apparatus, which can be used not only for the projection of pictures on film but also to display geographic maps, texts, etc. to students. The existence of central offices open to the teaching profession will permit all teachers or professors to have access to useful materials that have been gathered there, in addition to what they will supply or create themselves.

8. Applications to *Industrial and Decorative Arts and Industrial Technology* will be no less interesting. The system will allow the engineer, or even an artisan, to view a model document of any desired size. It is even unnecessary to get a photographic print in order to have a copy; all that is necessary is to trace the outline of what has been projected in pencil in order to have all or part of the document being used transferred to paper to the desired scale. It is also possible in this way to obtain a composite drawing formed from elements taken from different documents which have been juxtaposed, superimposed, or presented at different degrees of enlargement.

9. The new method ensures absolute authenticity in the reproduction of *older archives*. It also allows the formation of new central archival offices which have become necessary since the war as the result of the creation of new states.

For *modern archives* (the administrative documentation of public or private organisations) it can be anticipated that the procedure will result in the ideal copying machine.

At the moment the procedure has been applied to cadastral maps and it could easily be extended to registry offices and to anthropometric services⁷ where it would do away with much transcribing and hence with many errors.

Advantages: The Economic Factor

The principal characteristics of the system are: rapidity, economy of space, simplicity of handling, and the low cost price. The system involves only known elements in current use that are readily available everywhere.

By way of orientation we can present the following minimum figures based on the present market price and present status of the equipment: for a unit of film (an image 18 x 24mm): 10 gold centimes for the original negative, 2 gold centimes for a secondary positive. Thus, to clarify the issues by an example: two pages of a book, 12 x 20cm or 240cm² (common format, 10 point Charpentier type face⁸) can be photographed on each frame of film for 10 gold centimes a frame. The price of the negative of a 200 page book would therefore be 10 gold francs. Each positive designed for reading would cost 2 gold francs. In addition, any number of copies could be made on photographic paper to any

size desired, the price naturally varying with that of the paper. The applications of the new "trichrome" procedures allows us to look forward to microphotographic film in absolutely faithful natural colours.⁹

Union of the Spoken Word and the Document

Broadcasting has brought about a revolution in the diffusion of the spoken word. This revolution will be improved when the spoken word and the document are brought together at a distance. A lecturer will no longer be confined simply to addressing audiences in their own homes, but as a result of the new procedure, he will be able at the same time to let those who have received the film watch illustrations of his lecture on which he can comment as he goes along. Thus we are led to envisage international education in a new form: a chair occupied by a single professor speaking to listeners around the world who will be able to *see* at the same time as they *hear*. In light of recent developments, what can hold television back?¹⁰

Local Centres and the "Super-Centre"

By combining all the central offices discussed in this note, one could create a "Document Super-Centre." This would be in contact with national centres to which a country's principal offices of documentation and libraries would be linked to form stations in a universal network. They would be provided with limited equipment for copying their own collections and for the reading of microfilms by the public. The books, articles and documents that have been filmed would be brought together in a great collection. Gradually a classified *Microphotic Encyclopedia* would be formed from them, the first step toward new *microphotolibraries*. All of these developments would be linked together to form a Universal Network of Documentation.¹¹

Thus would economy of effort in the conservation and distribution of documents be obtained to a degree impossible with the means presently in use.¹²

Editor's Notes

1. Robert Goldschmidt and Paul Otlet, *La Conservation et la diffusion internationale de la pensée: le livre microphotique*; Publications No.144; Bruxelles: 11B, 1925.
2. Robert Goldschmidt and Paul Otlet. *Sur une forme nouvelle du livre: le livre microphotographique*. IIB Publication No. 81; Bruxelles: IIB, 1906 (this is translated as paper No.5 in this volume).
3. "Volumen," which means "a thing rolled up" has been used to describe the papyrus rolls used in the ancient world.
4. The illustrations of the apparatus which are contained in the paper but not reproduced here, though difficult to interpret with respect to scale, suggest that the authors somewhat exaggerated the size of what had actually been achieved with the reading machines.

5. In Belgium brief notices of patents were published sequentially as a form of official registration in the *Moniteur belge*, the official government gazette.
6. On August 25, 1914, invading German troops fired the ancient library of the Catholic University of Louvain destroying several hundred thousand books including about 1,000 incunabula, together with a large number of manuscripts and the university's archives. The Germans were again responsible for the destruction of much of the Library in 1940.

On September 1, 1923 Tokyo was struck by a great earthquake. In the ensuing fires, twenty-eight libraries were destroyed and over a million volumes lost.

7. The potential use of microfilm for cadastral surveys and in maintaining a central official registry of births, deaths and marriages is fairly clear. It is possible that in addition, Otlet and Goldschmidt refer to services such as police, concerned with the physical identification of individuals, services using techniques developed particularly by Alphonse Bertillon for the identification of criminals. These techniques involved a complex system of measurements of facial and physical characteristics. They were eventually superseded by finger-printing (see Editor's note 37 to Paper 2 "Creation of a Universal Bibliographic Repertory..." in this volume).
8. Charpentier used a reduced format for his books, following a Belgian practice as opposed to other Parisian publishers who, it has been said, "could make the shortest novel into four volumes" (Baukin, *Book Typography*, p. 9). The books were in 18 mo. Goldschmidt and Otlet also refer to the dimensions of the Charpentier format in their 1906 paper - see Otlet's note [10] to Paper No. 6 "On a New Form of the Book..." in this volume.
9. The trichrome process is a form of colour printing using the three primary colours: yellow, red, and blue. Goldschmidt and Otlet presumably refer to the process as improved after 1906 by the use of photographic plates and filters which made it economical and led subsequently to considerable refinements in technique and effect.
10. Otlet was writing at the beginning of the golden age of radio which had not long come into commercial use. The practical applications of television were a long way off, experimental television broadcasts only beginning in the late 1920's and early 1930's. No doubt Goldschmidt with his interests in (and experimentation with) radio and wireless telegraphy kept up with the developments in television. Otlet discusses radio, what he calls Telephotography (a form of telefacsimile transmission) and television "properly speaking" in his *Traité de documentation*, pp.233-238.
11. "Otlet and his colleagues at about this time began to create an *Encyclopaedia Microphotica Mundaneum* using the collections and the charts, tables and maps being devised at the Palais Mondial for various educational purposes. Among the series of microfilm strips were: No. 6, "Egyptian Civilisation"(38 exposures), No. 50 "The League of Nations and Peace"(24 exposures), No. 82 "History of the Papacy"(49 exposures), No. 257, "Mongolia"(56 exposures), No. 258, "Etterbeek -

Bruxelles"(52 exposures). In addition, a weekly news service was begun which reproduced newspaper and journal articles on various contemporary subjects on microfilm. This eventually had about 50 subscribers.

12. The authors append to their paper the following statement: "Resolution of the International Congress of Librarians and Bibliophiles, Paris, 1923. Proceedings and Memoirs. p. 79, 12⁰, 'that libraries should be organised so as to be able to issue photographic reproductions from negatives, the preservation of which will do away with subsequent requests and needless inconvenience.' "

16. 28TH UNIVERSAL PEACE CONGRESS: THE BELGIAN APPEAL TO THE WORLD¹

Nations of the earth, O world, in the tumult of events harken to the voice of Belgium! Well you know little Belgium who, after eighty-four years of peace and uninterrupted labour, awoke one morning in 1914 to a Europe in flames and for four years was a martyr to what followed.

In 1918 reparation and security were promised to Belgium. Above all was the promise that not only would Belgium not have to undergo this terrible experience again, but that nowhere would it ever recur. Substantial institutions, administered in a spirit of cooperation and peace were to ensure this.

And now, in 1931, all that Belgium hears is the agitated sounds of artillery and the drone of aircraft on training flights. All that she smells are the experiments being undertaken with gas. And more, as if a war of economics has followed the political war, Belgium is shaken by the crisis that has sadly overtaken her as it has her neighbours. It is as if the social war has had in its turn to assume a different reality. All that she apprehends are rumours of revolution, the echoes of confusion near at hand and of upheavals far off.

O World, hear my lamentation and my plaint! They arise as much from fear and uncertainty as from evils already suffered. Hear my question: "Where are you going? Towards what destiny do you lead us? How much longer will you leave everything to chance? Do you wish to abandon men to the worst uncertainties of a humanity enlarged by all the weight of numbers, by shrinking distances and by the power of science and technology, a humanity driven by vast designs.

A nation having done nothing, wishing to take nothing, to destroy nothing, must my martyrdom begin again on the secular battlefield of Europe, a slaughter-house of peoples. Must I be ravaged and destroyed anew. Having given my sons, must I now give my grandsons?

Opposing camps have set up immense war machines. They are material and technological in the front lines and social and psychological in the rear. All are agreed on this one point that henceforth these engines are a part of a single complex mechanism. Activating them requires only the smallest trigger, smaller than what is needed to throw a switch. To live with these machines is frightening; they transform existence into a nightmare. One mistake, a misunderstanding, a misjudgment, not to speak at all of any criminal intention, and immediately, irresistibly all the gears begin to engage, snatching up here our precious possessions, there inflicting grievous wounds, everywhere seizing the principles, ideals, and sentiments that have been declared to be sacred because without them life was thought to be impossible, to be not worth living.

What must be done, O World? First our state of mind must be transformed. War must be rooted out of our thoughts, our feelings, our instincts. It must be rooted out of any of the institutions whose hearts it has touched however little. This requires a gigantic effort, a renewal of life and civilization, the sacrifice of an education, a frame of mind inculcated since the cradle, the overturning of an economic system, which if it does not expressly desire war, at least leads to it and does not repudiate it. Nevertheless, like life, tomorrow has a cost of sacrifice and we are now compelled to seek a rational and peaceful revolution in order to avoid its violent and chaotic alternative.

But any revolution is only the manifestation of a state of mind in the mass of a people or period. Once its ideas for peace have been formulated they must then be disseminated to influence public opinion. It is necessary to embody these ideas in stable, general institutions, to strengthen those institutions that are still only experimental and to improve them all in relation to five essential points.

1. Enforce the judgments of the International Court of Justice by means of sanctions imposed by a *World Police Force* that counterbalances the individual forces left in the armed hands of the states;
2. Replace the present arbitrariness of international organs by the stable framework of a *World Constitution* extended by an immediate codification of international law.
3. Under the requirement of unrestricted admission, complete the Assembly at Geneva in which only governments are represented - and only some of them - by a *World Parliament* that is representative of the peoples and the interests of the whole world.²
4. Give all the elements of international life the means of making contact with each other in an extraterritorial *World City* which will function as a permanent home for associations and will express in a visible symbol the oneness of mankind.³
5. Finally, in such a milieu, guaranteed and supported by these institutions, develop a complete *World Plan* which will coordinate all individual and fragmentary plans into one, and thereby prevent the nations exhausting themselves by pulling in different directions while thinking that they are working toward the local good. This only helps bring about general warfare.

Peoples of the world, do you, like me, your little sister Belgium, wish therefore for Peace, General Peace, that Peace without which work will be unavailing in the future, and the shaping of honest, sensitive and intelligent men, in vain? Hear my cry of anguish. Respond to this appeal. Without wasting an hour, all assembled together let us at last offer to mankind the Organisation that it awaits. Founded on a Constitution and directed by a Plan, such an organisation will simultaneously bring about on Earth the conditions for and the rights of Universal Civilization: Liberty, Justice, Prosperity and with them a Flight to Boundless Progress.

Editor's Note

1. *XXIII Congrès universel de la paix. Appel des belges au monde. Présenté par M. Paul Otlet.* This is numbered N.No 6431, 5 July 1931 and was found in the Old Mundaneum attics in the Parc Léopold.

Otlet's "Appeal", headed "La Belgique et l'organisation mondiale" [Belgium and World Organisation] was reprinted as Appendix 5 of his *Monde: Essai d'universalisme*, 1935, pp. 459-461. It mentions the 5 elements needed for improved world organisation but omits the numbered sections and their brief commentary. In a footnote Otlet comments: "still relevant in 1935." It was: Hitler had effectively scuttled the Disarmament Conference in 1933 and had at the same time notified the League of Germany's withdrawal as a member. In 1935 he caused consternation by repudiating the arms clauses of the Treaty of Versailles; in that year Italy invaded Abyssinia.

The 28th Universal Peace Congress was held at the Palais Mondial from July 5 - 10, 1931. In effect these Congresses were the Annual meetings of the International Union of Peace Societies whose executive body was the International Peace Bureau headquartered in Geneva. La Fontaine had helped create the International Peace Bureau in 1891. He was President from 1908 until his death. On the agenda of the Brussels conference were two great issues: disarmament and a European Union. Disarmament was a particularly topical concern because, after five years of preparatory work, the League of Nations Conference on Disarmament was scheduled to open in February 1932 at Geneva. It broke up in June 11, 1934, a failure. Both issues are no less important and no less an active part of the international political agenda to day.

2. It will be recalled that a number of States were not members of the League, most notably the U.S. which never joined. Otlet, who became quickly very disillusioned about the effectiveness of the League, also believed the international associations should be represented in an ideal League or Society of Nations. See Paper 11, "The Organisation of the Society of Nations" in this volume.
3. Otlet became deeply committed to the idea of an "extraterritorialised" world city in which the Mundaneum could be set and flourish unhindered by the kind of political difficulties that beset it in the 1920s leading ultimately to its closure from 1934-1939. In 1927-28 he interested Le Corbusier in the idea of developing something of the kind in Geneva. Much of his later work was devoted to exploring the idea in relation to Brussels, Anvers and other places. (See Catherine Courtiau "L'Epopee de la Cité mondial de Paul Otlet," *Lectures* No. 41 (1988): 13-17.

17. HENRI LA FONTAINE¹

La Fontaine: I went up to him in 1892 and he came up to me in 1934. Forty-two years - a split second! - in the course of which the International Institute of Bibliography was conceived, created, developed, defended, modified, expanded, saved and replanted.

In those distant times, La Fontaine was a mysterious person to the common man. Because, while he was very much a barrister, like me, at this period enjoyed independent means, like me, was quite indifferent about what was said about him, like me, he was also a Wagnerian, a pacifist and a feminist, which I was not.² We had both become enamoured of Universality, which means in terms of efficient work, enamoured of internationalism - an alias for what later we came to describe as "mondiality," very much a barbarism to the French ears of our friends.

Practical idealists following different routes, we had come to realize that nothing was possible without Documentation, another neologism, and that the "a b c" of this was Bibliography for which, in its turn, the "a b c" was Classification. In The Société des Etudes Sociales, whose secretariat La Fontaine had set up, he accumulated index cards for books on the various topics of sociology and he published lists of them in the Society's *Revue*.³

As for me, his junior by fourteen years, soon after my admission to the Bar, I founded an international journal of legal bibliography. The two works were merged to become the *Sommaires de droit et de sciences sociales*.⁴ This index, however, only published a part of what had been collected: there was a residue of cards and there was the necessity for cumulations for which, naturally, it was useful to keep all the printed cards. There was also the demon of universality, *du noir sur blanc*, of cooperation in intellectual relations transcending frontiers. All were things that took form in the International Office of Bibliography and had as their location our first separate premises in the Hotel Ravenstein, since transformed into the Hotel des Sociétés Savantes, a transformation for which we were partly responsible. These were premises no greater than 5 metres, along with a very small annexe in an old building that had belonged to the Lords of the same name, and were hidden away in the maze of a quarter now demolished to create a sixteenth century neighbourhood for the twentieth century Palais des Beaux Arts.⁵

As our yellowing photographs show, the first International Conference of Bibliography in 1895 founded the Institute, which was footloose and travelled, but was given a home at the headquarters of the Office, which was sedentary and worked on the spot.⁶

When La Fontaine and I meet up with each other now, seeming hardly to have changed at all except for a little whitening of the hair and stooping of the shoulders, we do so at the World Palace, yes Palace, to deal with the business of the Union of

International Associations which, together, we summoned into existence in 1910. We have always been companions in travel and intellectual adventure, always free of the shackles of the official world, always striving toward greater cooperation.

Certainly Henri La Fontaine never hung back from work, or more exactly and so many times, from the task at hand. He is a kind of being made from steel, with the eyes of a twenty-year old, for whom ten or eleven hours of work are natural.

Bibliographic work was a form of diversion while he went about winning the Nobel prize, went to meetings for socialist workers, strummed at the piano to share the joys of Bayreuth, vice-presided over the Senate or officialized in Geneva, without ever pontificating, as the Belgian delegate to The League of Nations.⁷ Was bibliographic work only a diversion or were these other functions incidental? Only Madame La Fontaine can say, who tells the story of part of her honeymoon spent in correcting card-proofs and who later bundled card-proofs into packets that the Vice-president carried to the Senate. Silent and powerless witness, she was present at the attack of acute "decimalitis" which gripped her husband in these last years when, as old as he was and with him as co-author, the new edition of the *Tables de la Classification Décimale* was launched into the world.⁸

What a lot of battles for a pacifist like him, who persuaded of the justice and usefulness of causes, let himself easily be led by the combatant who toiled at his side to gain ever new conquests of intellectual organisation!

I thought of this yesterday, when our Dutch friends were urging me to send them these few lines. We were seated at our common table - the chronological if not yet historical one - a table where 1 and 3 and 6 have been so often discussed, where our lips have so often repeated the names of Dewey, Field, Masure, Lameere, Losseau, Wouters, Donker Duyvis, Bradford, Pollard, Alingh Prins, Sebert, Richet, Sustrac, Bayle, Morel, Hanauer, and those of the women who have toiled for us for thirty years, Poels and de Bauche, and those of our blessed printers, Lamberty and Van Keerberghen⁹ who have been as keen as us to avoid typographical errors and to be on time, and as cast down as us when misprints have been noted or the post has been missed.

Yesterday, the Friends of the Palais Mondial, assembled in a great Council to discuss the heart-breaking decision of the Minister of Public Works, M. Sap. As a consequence of this decision, off you go!, all our quarters, a hundred rooms, a hectare filled chock full of *omni re scibili* should be evacuated within forty five days.¹⁰ Ah! This innocent executioner of a Minister! He is truly "sapping" us just when so much remains to be done because so much has already been done. He lacks documentation, this cruel man. Because he does not want to inconvenience himself by coming to see for himself, he, whose responsibility is Buildings, is unaware that there are files containing deeds that assert our legal and moral rights in the registries of his colleagues for Sciences and Arts, Justice, even Foreign Affairs. There, at yesterday's meeting which was organised for defense, in a loud voice were read articles from the reactionary and small-minded local press.¹¹ Once again Henri La Fontaine's name has been linked with Paul Otlet's. Today, in the same mocking tones¹² as ten years ago, twenty years ago, forty years ago, the "enlightened ones" who have filled the Great Hall of the Cinquantenaire with cards covered with cabalistic decimal signs, preventing its use for more practical and lucrative purposes, have been exposed to public condemnation.

Ah! My dear Henry, when our glances met during this reading, didn't they reveal a hint of lofty melancholy that automatically caused us to shrug our shoulders? Together we have seen so much of this kind of thing, and surely so much has tumbled down around us in these last few decades that we are filled with an ironic indulgence for these people who truly "know not what they do."

You were more resigned than I when I said that it was necessary to explain to our opponent what he had done. But you were as fervent when I had to conclude that, tomorrow like yesterday, long may our beloved Institute live!

Editor's Notes

1. Paul Otlet, "Henry La Fontaine," *IID Communicationes*, 1Fas.2 (1934):2-5. This issue of the *IID Communicationes* was dedicated to La Fontaine on the occasion of his 80th birthday. Otlet's article, which he signs and dates 1934.04.16, was preceded by a short editorial, "Une Félicitation", and was followed by 7 pages of congratulatory messages from old (and new) friends and collaborators of the Institute. A brief page of formal biography with a selected bibliography followed these messages. On the very next page is a combined obituary notice for Charles Bayle and Eugène Morel whom Otlet mentions in the text of his article.
2. La Fontaine's Wagnerian interests led him to publish verse translations of the first act of Die Walküre and of the Prologue to Götterdämmerung. His musical interests brought him the friendship of Queen Elizabeth as his "alpinist" ones, not mentioned by Otlet but very important to La Fontaine in his younger days, brought him the friendship of King Albert.

As a pacifist, La Fontaine was active in founding the Société belge d'Arbitrage et de la Paix which sponsored a Universal Peace Congress in Antwerp in 1894, the proceedings of which he edited. He participated in the founding of the Bureau International de la Paix in 1892 and was its President from 1907-1908 until the War and afterwards until his death. He worked actively in The International Parliamentary Union after his election to the Belgian Senate. He published major treatises and bibliographical compilations dealing with international arbitration and the Peace movement and, of course, he was awarded the Nobel Peace Prize in 1913.

As a "feminist," he worked with his sister, Léonie, whom La Fontaine's memorialist describes as "herself a militant socialist, ardent promoter of feminism and supporter of movements for the emancipation of women." He was for a time President of the Association for the Professional Education of Women. (Robert Abs, "Fontaine (Henri-Marie La)" *Biographie nationale*; See also "Peace 1913: Henri Marie La Fontaine", *Peace 1901-1925: Nobel Lectures ...Vol 1*, pp.268-276).

3. *Revue sociale et politique*, 1871-1895, was the organ of the Société des Etudes sociales et politiques.

4. For an account of the *Sommaire méthodique des traités, monographies et revues de droit* see Editor's Note 43 to Paper 2, "Creation of a Universal Bibliographic Repertory..." in this volume.
5. Otlet refers here in general to what was called the Ancien Cour, the residence of the Austrian Stadholders of the Netherlands after 1731. Specifically, the locations given to the O1B-11B for the Bibliothèque Collective des Sociétés Savantes was the Ancien Chapelle St. George, 27a Montagne de la Cour. In 1907, the lower ground floor of the Palais des Beaux Arts, 3bis Rue de la Régence, became the site for this library - an area of 750 sq. metres. The O1B-11B itself was moved from the Hotel Ravenstein to the second floor of the Musées Royaux, a location that was, in effect, part of The Bibliothèque Royale. The provision of appropriate and related accommodations for the Royal library, Archives and Art Museums (and the 11B) was a much discussed matter before the War in Brussels with a number of schemes being advanced for developing the area, the Mont des Arts, in which these agencies were clustered.
6. According to its Statutes the Institute was an international organisation which could meet anywhere it was desirable to do so. Anyone interested in general questions of bibliography could join it and take part in its peripatetic meetings. Before the War, Conferences of the Institute were held outside of Brussels only once - Paris in 1900. In the late 20s and subsequently, what became Annual conferences were frequently held outside of Brussels. The Office International de Bibliographie, on the other hand, was a local, quasi-official agency of the Belgian Government which formally ceased to exist only in 1985 when the remaining assets of the Mundaneum (into which the Office International de Bibliographie had ultimately been transformed) were absorbed by the Centre de Lecture publique de la Communauté française in Liège. Thus, while the O1B acted as the headquarters of the Institute, it was separate from it, hence Otlet's play on words.
7. La Fontaine was an ardent socialist attracted to the Parti Ourvier Belge (Belgian Workers Party) by Emile Vandervelde, eminent scholar and later Socialist minister and Prime Minister. La Fontaine entered Parliament on June 24, 1895 and until 1898 was provincial Senator for Hainaut. From 1900 to 1932 he was Senator for Liège and then from 1935-36 Brabant. He was Secretary to the Senate from 1907-1919 and a Vice-President from 1919 to 1932. He was part of the Belgian delegation to the Paris Peace Conference in 1919 and represented Belgium at The First Assembly of The League of Nations in 1920 and at the Second in 1921. He served (though not actively because of Vandervelde's regular presence) as Belgian alternate delegate to the Commission on International Labour Legislation which was set up at the Peace Conference in Paris in 1919 to draw up the Charter of The International Labour Organisation.
8. This was a difficult birth. Volume 1 of the second edition appeared in 1928, volume 2 is dated 1928-29 and Volume 3 is dated 1929. The fourth and final volume, the Index, for which La Fontaine seems to have been entirely responsible, did not appear until 1933 and the delay caused much anxiety and anger within the Institute's membership.

9. Of the names Otlet mentions, Prins, Bradford and Pollard, Donker Duyvis, Sustrac and Hanauer were among those sending greetings to La Fontaine. Bayle and Morel had just died and Dewey, Field, Lameere, Sebert and Richet were dead.

Melvil Dewey, 1851-1931, was perhaps the most influential American Librarian of his generation. Not only did he devise the Decimal Classification, he was one of the most active participants in the creation in 1876 of the American Library Association. He set up the first library school at Columbia University in 1887. His career was long and marked by much controversy. Founder of the Lake Placid Club in New York State, in later life he was less involved with libraries and bibliographical ventures of various kinds. He responded very openly and generously to Otlet and La Fontaine's overtures to develop a European version of his Decimal Classification, an interest that was continued by his son, Godfrey. Sarah Vann gives the early letters to and from Dewey about the IIB and its aims in *Melvil Dewey: His enduring presence in librarianship*. (Littleton, Colo.: Libraries Unlimited, 1978). (See also notes 20 and 21 to the second paper in this volume, "The Creation of a Universal Bibliographic Repertory ...").

Herbert Haviland Field, 1868-1921, American zoologist and bibliographer, created the Concilium Bibliographicum in Zurich in 1895. He at once adopted The Dewey Classification for use with the bibliographies to be published by the Concilium. He and his colleagues developed the Classification Tables for Zoology and related subject areas. He was responsible for Otlet and La Fontaine adopting the standard 3" x 5" card for The Institute's work rather than a card of a different size that they had initially considered.

Louis Masure, like Otlet and La Fontaine, had taken a Doctorat en Droit and had been admitted to The Bar. He was appointed Secretary of the 11B in 1901, following the death of Eugène Lameere. Next in responsibility to Otlet, not only did he administer the office, he actually carried out major bibliographical tasks, especially those that constituted the 01B's contribution to the *Bibliographie de Belgique*. He died in 1928.

Eugène Lameere, 1872-1901, historian and bibliographer, taught at the Université Libre de Bruxelles before becoming the 01B-11B's second secretary (Charles Sury had been the first). He died not long after taking up his duties.

Léon Losseau, 1868-1949, Lawyer, bibliographer and bibliophile, was one of Otlet and La Fontaine's earliest and most loyal supporters. From 1895-1901, he was one of the editors of *La Belgique judiciaire*. Before the war he was Secretary-General of the Fédération Archéologique et historique de Belgique and Secretary of the Société bibliophile belge. Later he was President of the Circle archéologique de Mons. His large, elegant house with its extensive library on the second and third floors became the Maison Léon Losseau, a Centre for Study and Intellectual and Artistic Development, by Royal Decree, 6 September, 1951.

Léon Wouters served as "Chef de service" at the OIB before the War when there was a considerable staff. After the War, he collaborated with Otlet on what became the *Manuel pour la bibliothèque publique*. He was Associate Director of the Union des villes et communes Belges and Secretary of the Union International des Villes.

He was responsible for much of the subscriber correspondence associated with the slow publication of the 2nd edition of the Universal Decimal Classification in the period 1924 through 1933.

Fritz Donker Duyvis, 1894-1961, chemical engineer, worked in the Dutch Patent Office, of which he eventually became President, for most of his working life save for 9 years with an agency which was concerned with disseminating information to light industry. He began to collaborate with Otlet and La Fontaine as a young man of 26. He was a member and then Chairman of the Committee for The Decimal Classification set up in 1921 (later the Central Classification Committee). In 1928 he was elected 3rd Secretary-General of the Institute, a position in which he continued, unpaid, until 1959. He is the single most important figure in the history of FID after Otlet with whom he worked closely until the latter's death.

Samuel Clement Bradford, DSc, FLA, 1878-1948, was keeper in the Science Museum, 1930-1938, and Chief Librarian of the Science Library 1925-1938. In 1927 he collaborated with Pollard to found the British Society for International Bibliography to be the English member of the IIB (it amalgamated with Aslib in 1948). An ardent propagandist for the UDC, Bradford also tried to create a universal catalogue and index for science and technology by expanding The Science Library's catalogue. He is now best remembered for his eponymous "law of Scatter" and for his pioneering book, *Documentation*.

Alan Faraday Campbell Pollard, 1877-1948, Fellow of the Chemical Society and Honorary Secretary of The Optical Society, had a career first in industry where, among other posts, he was Chief Physicist at the Nobel's Explosive Co. Ltd. Later he was Professor of Instrument Design at the Imperial College of Science and Technology in the University of London. He had first met Otlet in Brussels in 1908. In 1926 he published a translation of the UDC tables for Optics with a full explanatory introduction to the system. With Bradford he worked with the British Standards Institution on developing the complete English edition of the Classification. He was President of the IIB from 1928 to 1931 and was responsible for major organisational changes that can be argued to have saved it from collapse.

J. Alingh Prins, President of The Dutch Patent Office, followed Pollard as President of IIB, an office he held from 1932 until 1945.

General Hippolyte Sebert, 1839-1930, was a member of the French Corps d'Artillerie and conducted notable experiments in ballistics. He became President of the Association Française pour l'Avancement de l'industrie Nationale, the Société Française de photographie and the Fédération Espérantiste de France. He was also a member of the Institut. Otlet and La Fontaine shared his interests in photography and Esperanto. Sebert began a correspondence with them in 1895 that lasted the rest of his life. He helped found the Bureau Bibliographique de Paris, the first of the national sections of The Institute.

Charles Richet, 1850-1935, won The Nobel Prize for Physiology in 1913, the year of La Fontaine's Peace Prize. He became a member of the Institut in 1914 and President of The Académie des Sciences in 1933. He actively championed The

Decimal Classification and the ideals of the Institute before the war. He helped develop the expanded tables for Physiology.

Charles Sustrac. was Librarian of the Bibliothèque St. Geneviève in Paris, and was Secretary of The Bureau Bibliographique de Paris.

Charles Bayle, was Editor and Director of *La Librairie*, an independent book trade journal in Paris.

Eugène Morel, 1864-1934, was educated as a lawyer and was admitted to The Paris Bar. He became an assistant librarian in The Bibliothèque Nationale in 1892 and continued in that library until his death. He was an ardent propagandist for public libraries on the "Anglo-Saxon" Model. His *Bibliothèques publiques et la Librairie dans les deux mondes* of 1908 is a two-volume work which espouses many of the principles of the 11B, including The Decimal Classification and puts forward the notion of a bibliographical centre "without books." His *La Librairie publique*, which has a kind of sub-title, "Quel pédant inventa le mot Bibliothèque laissant le mot française *Librairie aux Anglais*", was published in 1901 and is an argument for setting up true public libraries in France. In addition to his bibliographic work, Morel was a popular novelist of some repute.

Dr. Julius Hanauer, was an electrical engineer and Librarian of the Allgemeine Elektricitätsgesellschaft, Berlin.

Mmes Poels and de Bauche are shadowy figures who were part of the staff of the 01B, having joined it in its heyday in the first decade of the century. After Masure's death, Mme. Poels, especially, seems to have acted almost as Otlet's secretary.

Lamberty and VanKeerberghen. The firm of Oscar Lamberty became the Institute's printers in 1899; VanKeerberghen et fils began to publish the 2nd edition of the Classification Décimale Universelle in the late 1920's (and also undertook to publish The English edition). Both printers were important because of their willingness to deal with the complexities of the bibliographical work of The 01B-11B, especially those associated with printing the Tables and indexes of the UDC.

10. "Omni re scibili" - all that is knowable. The Palais Mondial was closed June 1, 1934, Otlet, Lorphèvre, and others holding a vigil of protest before it. An appeal to the Courts was turned down in the autumn of 1935, the government expressing no grievance against the tenants arguing only that its undertakings to them were "precarious" and not binding with respect to these locations. It should be noted that this "eviction" occurred during that short period, 1932-1935, when La Fontaine was not a member of the Belgian Senate.
11. Otlet uses the phrase "miséoniste et microphile" which I have translated as "reactionary and small-minded."
12. Otlet uses the phrase "ton Zwanzeur" which I have translated as "mocking tones." "Zwanze" is a dialect word from Brussels (Robert notes its date of introduction as 1923) meaning "popular joke" "humorous story", a form of comedy or humour appropriate to "tall" tales.

BIBLIOGRAPHY OF THE WORKS OF PAUL OTLET

1882 to 1895, The International Institute of Bibliography

L'Ile du Levant. Bruxelles: Typographie et Lithographie E. Guyot, 1882. 39 pp.

L'Afrique aux noirs. Bruxelles: Ferdinand Larcier, 1888. 18pp.

Lettres sur la politique coloniale belge. Bruxelles: Imprimerie et Lithographie de la Côte Libre, 1889. [6] pp.

Otlet, Paul and Pierre Blanchemanche, rapporteurs, *Enquête sur la plaideoirie: réponses au questionnaire du Cercle d'études du Jeune Barreau de Bruxelles.* Bruxelles: Ve. Ferdinand Larcier, 1891. 95pp.

Blanchemanche, Pierre, Joseph Cassiers and Paul Otlet, *Sommaire périodique des revues de droit:* Table mensuelle de tous les articles et études juridiques publiés dans les périodiques belges et étrangers, t. 1-3; 1891-1893. Bruxelles: Veuve Ferdinand Larcier, 1891-1893.

Otlet, Paul and Henri La Fontaine, *Sommaire méthodique des traités, monographies et revues de droit,* t. 4; 1894-95. Bruxelles: Office International de Bibliographie [Note: Part of *Bibliographie internationale des sciences sociales* continued as *Bibliographia Sociologica.*]

La Fontaine, Henri and Paul Otlet, *Sommaire méthodique des traités, monographies et revues de sociologie,* 1894. Bruxelles: Office International de Bibliographie, 1894. [Note: Part of *Bibliographie internationale des sciences sociales;* continued as *Bibliographia Sociologica.*]

Otlet, Paul and H. La Fontaine, *Bibliographia Sociologica.* Sociologie et Droit. Sozialwissenschaft und Recht. Sociology and Law. Sommaire méthodique des traités et des revues, dressé conformément à la classification décimale, 1895. (Bruxelles: Office Internationale de Bibliographie, 1895)

De Boeck and Paul Otlet, *Les Prisons-asiles et les réformes pénales qu'elles entraînent.* Bruxelles: Hayez, 1892. 15 pp. (Extrait du compte-rendu du 3^e Congrès d'anthropologie criminelle, tenu à Bruxelles en 1892)

"Un Peu de bibliographie," *Palais,* 1891-92, pp. 254-271

[Otlet, Paul and H. La Fontaine], *L'Office international de bibliographie sociologique: économie sociale, législation, statistique*. Bruxelles: Siège de l'Office, Hotel Ravenstein, [1893]. 8 pp.

"L'Education correctionnelle: une visite à Ruyselede," *Palais*, 2-3 (1893): 20-33.

Gedoelst, Henri, Paul Otlet and Georges Schoenfeld, "Rapport sur l'organisation d'un Comité de défense des enfants arrêtés et traduits en justice présenté à l'Assemblée générale de la conférence du Jeune Barreau de Bruxelles," *Journal des tribunaux* 12 (1893): No 948, cols. 209-220; no. 949, cols. 225-233; no. 950, cols. 241-251; no. 951, cols 257-269.

Les Sentences indéterminées et la législation belge: rapport présenté au Groupe belge de l'Union Internationale de Droit pénal. Bruxelles: Veuve Ferdinand Larcier, 1893. 21pp.

"La Science juridique pure," *Palais*, 1893-4, pp. 42-54.

Des Obligations au porteur (pratique et législation comparées). Bruxelles: Veuve Ferdinand Larcier, 1894. 38pp.

L'Anthropologie juridique: communication faite à la Société d'anthropologie de Bruxelles dans la séance du 25 février, 1895. Bruxelles: Hayez, 1895. 36pp. (Extrait du *Bulletin de la Société d'anthropologie de Bruxelles*, tome XIII, 1894-95).

"La Bibliothèque Royale: à Monsieur le Ministre de l'Instruction Publique," *Art moderne* 14 (1894): 35-36. [Note: This article is unsigned.]

Le Chômage involontaire: contribution à l'étude de l'assurance contre le chômage. Paris: Secrétariat général du comité permanent du Congrès des accidents du travail, 1895. 52 pp. (Extrait du *Bulletin du Comité* . . . 6^e année, Jan-Mar 1895).

"Les Bibliothèques publiques en Belgique: La Bibliothèque Royale," *Art moderne* 15 (1895): 36-37 and 44-45. [Note: This article is unsigned.]

"Les Bibliothèques publiques à l'étranger. Fait à retenir et à méditer par la Commission de la Bibliothèque Royale," *Art moderne* 15 (1895): 139-140 and 148-149.

P.O., "Bibliothèque de sciences sociales," *La Justice* 3 March 1895 [p. 2].

1896 to 1907, The Central Office of International Associations

Otlet, Paul and Henri La Fontaine, "Création d'un répertoire bibliographique universel: note préliminaire," *IIB Bulletin* I (1895-96): 15-38. [Also published as: Conférence Bibliographique International, Bruxelles, 1895, *Documents: Note sur la création d'un répertoire bibliographique universel*; Office international de Bibliographie Publication no. 1; Bruxelles: Imprimerie Veuve Ferdinand Larcier, 1896. 26pp.]

"Le Programme de l'Institut International de Bibliographie: objections et explications," *IIB Bulletin* 1 (1895-96): 73- 100.

"Sur la structure des nombres classificateurs," *IIB Bulletin* 1 (1895-96): 230-243.

"Statistique internationale des imprimés: quelques sondages," *IIB Bulletin* 1 (1895-96): 300-319.

P.O., "Observations critiques sur le mémoire précédent [i.e. "La Généalogie des sciences: quelques remarques sur la bibliographie des mémoires scientifiques et le principe de classification naturelle des sciences par Henryk Arctowski"], *IIB Bulletin* 2 (1897): 95-97.

Nos Livres et leurs amis les bibliographes: conférence donnée le 15 mars 1898 à la Société des Sciences, des Arts et des Lettres du Hainaut...compte-rendu publié dans le supplément au *Journal de Mons* du dimanche, 27 mars 1898. Mons: V. Janssens, 1898. 23pp. [Note: a report of the lecture signed "Ed. Ch." - i.e. Charles Losseau].

"Observations à propos de la Note de M. Solvay relative au comptabilisme," *A Propos du comptabilisme social*. Bruxelles: Institut des Sciences Sociales, 1898. pp. 34-38 (Extrait des *Annales* de l'Institut des Sciences Sociales).

"Examen du projet de la Société Royale de Londres concernant le Catalogue International des Sciences 1. Observations présentées au point de vue de la méthode bibliographique," *IIB Bulletin* 4 (1899): 5-51. [Note: This is followed by: "II. Le Programme de classification de physiologie d'après la Société Royale" by Charles Richet, pp. 53-57; and III. "The International Catalogue of Scientific Papers" by Herbert Haviland Field, pp. 59-73, an article reprinted from *Science*.]

"Le Répertoire bibliographique universel: sa formation, sa publication, son classement, sa consultation, ses organes," *Compte-rendu des travaux de Congrès bibliographique international tenu à Paris du 13 au 16 avril 1898*. Vol. II; Paris: Au Siège de la Société bibliographique, 1900. pp. 135-160.

"Statistique internationale des imprimés," *IIB Bulletin* 5 (1900): 109-121.

"Le Répertoire bibliographique universel et la coopération internationale dans les travaux bibliographiques," *Procès-verbaux et actes de Congrès international de bibliographie tenu à Paris, 1900*. Bruxelles: IIB, 1901. pp. 106-116. (Also issued separately as IIB Publication No. 51).

"Comment classer les pièces et documents des sociétés industrielles: Résumé d'une causerie faite aux membres de l'Unité sténographique de Belgique dans la Salle des Répertoires de l'Institut International de Bibliographie," *IIB Bulletin* 6 (1901): 85-125. [Also published separately in 1901 in *l'Okygraphe*, the monthly journal of L'Unité sténographique de Belgique, with the same title and subtitle, and in 1902 as Publication no. 2 of the Comité d'étude des travaux d'administration, Bruxelles].

"Un Document d'art allemand," *Art moderne* 21 (1901): 259-261.

"L'Importance et le rôle des périodiques: études sur la statistique internationale des imprimés," *Revue vinicole belge* 5 (March 1901): 365-66. [Also published as "L'Importance et le rôle des périodiques (with note: extraits de nos études sur la statistique internationale de bibliographie)," *Bulletin de l'Union de la presse périodique belge* 1, no 1 (January 1901): 1-3.]

"La Technique et l'avenir du périodique," *IIB Bulletin* 6 (1901): 179-185. [Also published in the *Bulletin de l'Union de la presse périodique belge* 2 (1902): 10-12, 17-19.]

"Le Catalogue international de la littérature scientifique (International Catalogue of Scientific Literature)," *IIB Bulletin* 7 (1902): 203-209.

"Comment je voudrais construire mon cottage au bord de la mer," *Cottage* 1 (1903): 163-164.

"Les Sciences bibliographiques et la documentation," *IIB Bulletin* 8 (1903): 125-147.

P.O., "Iconothèque botanique," *IIB Bulletin* 9 (1904): 110-112.

"Sur la création d'un répertoire des articles de la presse quotidienne," *IIB Bulletin* 9 (1904): 306-311.

"Le Littoral belge," *Cottage* 2 (1904): 177-186.

"L'Organisation rationnelle de l'information et de documentation en matière économique: examen des moyens d'assurer aux services de renseignements des musées coloniaux et commerciaux, ainsi qu'aux offices de renseignements industriels et commerciaux indépendants une plus complète utilité au point de vue de l'expansion mondiale. Rapport présenté au Congrès international d'expansion économique mondiale réuni à Mons les 24-28 septembre, 1905." *IIB Bulletin* 10 (1905): 5-48. (Also published as IIB Publication no. 69.)

"L'Etat actuel de l'organisation bibliographique internationale," *IIB Bulletin* 10 (1905): 183-213. [Also published in 1906 as IIB Publication no. 75, and subtitled "Rapport présenté au v^e Congrès international des éditeurs, Milan, 1906."]

"L'Impression directe sur fiche," *Annales de l'imprimerie* 4 (1905): 141-143.

Un Musée du livre à Bruxelles: projet de constitution d'une société ayant pour objet la création du Musée. Publication no. 2; Bruxelles: Musée du Livre, 1905. 10 pp.

"La Réforme de la loi sur les sociétés commerciales: opinion de M. Paul Otlet, avocat d'appel de Bruxelles," *Chronique industrielle, maritime et coloniale* 2 (1905): 97-99.

"Programme d'un Congrès de la presse périodique: rapport présenté par M. Paul Otlet à la réunion des représentants de la presse périodique à Liège, le 11 septembre, 1905," *Bulletin de l'Union de la presse périodique belge* 14 (1905): 157-163.

"La Classification rationnelle des comptes et le schéma universel de comptabilité," *Revue de l'ingénieur et index technique* 7, No. 3 (December 1905): 1-4.

"Le Rôle de l'hypothèse," *Le Samedi littéraire et artistique*, 2, no. 14 (15 April 1905): 1-3

Projet de constitution d'une société ayant pour objet la création du Musée. Publication No. 11; Bruxelles: Musée du Livre, 1906.

"La Documentation par la photographie au Congrès de Marseilles," *Le Matin de Bruxelles*, October 29, 1906.

Les Aspects du livre: conférence inaugurale de l'exposition du livre belge d'art et de littérature organisée à Ostend par le Musée du livre. Publication no. 8; Bruxelles: Musée du Livre, 1906. 35pp. [Also published in part as "L'Evolution du Livre (extrait de *Les Aspects du livre*)," *Musée du Livre* 1, fasc. 1 (1907) [2 pp. following planche 7] and in *Annales de l'imprimerie* 5 (1906): 120-123.]

"De quelques applications non bibliographiques de la classification décimale," *IIB Bulletin* 11 (1906): 92-99.

"Le Livre considéré comme instrument de culture intégrale," *Pour L'Ecole* 6 (1906): 146-152, 185-188.

L'Etat actuel de l'organisation bibliographique internationale. Publication No. 75; Bruxelles: IIB, 1906. 33pp.

L'Organisation de la documentation en matière technique et industrielle: le nouveau service technique de l'Institut International de Bibliographie. Publication no. 73; Bruxelles: IIB, 1906. 6 pp. [Also published in *Revue de l'ingénieur et index technique* 7, no. 4 (January 1906): 1-6 and in summary as "Le nouveau service technique de l'Institut International de Bibliographie," *Journal des brevets* 20 (1906): 138-139.]

Organisation rationnelle de la documentation pour l'étude des régions polaires: rapport présenté au nom de l'Institut International de Bibliographie au Congrès international pour l'étude des régions polaires, Bruxelles 1906. Publication no. 79; Bruxelles: IIB, 1906. 11 pp.

Otlet, Paul and Ernest Vandeveld, *La Réforme des bibliographies nationales et leur utilisation pour la bibliographie universelle:* rapport présenté au v^e Congrès international des éditeurs, Milan, 1906. IIB Publication no. 77; Bruxelles: IIB and l'Administration de la Bibliographie de Belgique, 1906. 8 pp.

"Sur le livre et l'illustration: Avant-lire de catalogue," *Exposition internationale de photographie: Catalogue du 1er Salon du Livre.* Bruxelles: Cercle d'études typographiques de Bruxelles, 1906. p. 7-20. [Also published as "Le Livre et l'illustration: extrait de l'avant-lire de Catalogue du Premier Salon du Livre à Bruxelles," *Annales de l'imprimerie* 5 (1906): 33-37.]

1907 to 1910, World Congress of International Associations

Paul Otlet and Robert Goldschmidt, *Sur une forme nouvelle du livre: Le Livre microphotographique.* Publication No. 81; Bruxelles: IIB, 1906. 11pp. [Also published in *IIB Bulletin* 12(1907):61-69, in *Journal des brevets*, January 1907 and in extracts in *Photorevue*, 6 January 1907.]

L'Organisation systématique de la documentation et le développement de l'Institut International de Bibliographie. IIB Publication No. 82; Bruxelles: IIB, 19807. (also published in *IIB Bulletin* 12(1907):3-64.

[Otlet, Paul], *Edouard Otlet*. [Bruxelles: Des Presses d'Oscar Lamberty, 1907.] [8 pp.]

"La Littérature technique et la documentation," *Revue de l'ingénieur et index technique* 10, No. 2 (1907): 1-8.

"L'Inauguration de la Maison du Livre," *Art moderne* 27 (1907): 26-28, 43-44, 50-51. [Also published in part in *Musée du Livre* 1, Fasc. 2 (1907): 12-14.]

Goldschmidt, Robert and Paul Otlet, "Sur une forme nouvelle du livre: le livre microphotographique," *IIB Bulletin* 12 (1907): 61-69. [Also published in *Journal des brevets*, January 1907, and in extracts in *Photorevue*, 6 January 1907].

"La Charte mondiale", *L'Independence belge*, 29 February 1907.

"Assemblée générale du dimanche 17 fevrier 1907: [Rapport sur la situation générale de notre Union]," *Bulletin officiel de l'Union de la presse périodique belge* 16 (March-April 1907): 53-59.

"Sur le livre et l'illustration: Avant-lire de catalogue," *Exposition internationale de photogravure: Catalogue du 1er Salon du Livre*. Bruxelles: Cercle d'études typographiques de Bruxelles, 1906. p. 7-20. [Also published as "Le Livre et l'illustration: extrait de l'avant-lire de Catalogue du Premier Salon du Livre à Bruxelles," *Annales de l'imprimerie* 5 (1906): 33-37.]

Le Programme du ministère des Sciences et des Arts: rapport préliminaire aux discussions, présenté par M. Paul Otlet à la Libre Académie de Belgique en sa séance du 16 mai 1907. Bruxelles: Editions de la Belgique artistique et littéraire, 1907. 31pp.

"A Propos de la création du ministère des Sciences et des Arts: le texte de la lettre ouverte que M. Paul Otlet, secrétaire- général de l'Office international de bibliographie et vice-président de l'Union de la presse périodique belge vient adresser à M. le Baron Descamps, ministre des Sciences et des Arts," *Bulletin officiel de l'Union de la presse périodique belge* 16 (June-July 1907): 117-121.

"La Presse périodique et l'enseignement," *Bulletin officiel de l'Union de la presse périodique belge* 16 (August 1907): 141-143.

"Les Nouveaux types de revue: La Revue documentaire. La Revue internationale," *Bulletin officiel de l'Union de la presse périodique belge* 16 (August 1907): 269-275. [also published in *Actes du troisième Congrès de la presse périodique belge*, Spa, 1907. Bruxelles, Musée du Livre and Union de la presse périodique belge, 1907: 73-79.]

"Question du jour: le livre," *L'Independence Belge*, 2 September 1907.

"Bruxelles, la capitale du monde," *Courier de la Paix*, 13 October 1907, pp. 2-3.

"La Loi d'ampliation et l'internationalisme," *Mouvement sociologique international* 8 (1907): 133-162. [Also issued separately as *La Loi d'ampliation et l'internationalisme*; Bruxelles: Imprimerie Polleunis et Ceuterick, 1908. 34 pp.]

"La Bibliothèque collective des sociétés savantes de Bruxelles, organisée par l'Institut International de Bibliographie: Discours prononcés à l'occasion de l'inauguration le 16 décembre 1907. Discours de M. Paul Otlet," *IIB Bulletin* 12 (1907): 281-292. [Also published in *L'Organisation du travail scientifique au xx^e siècle et le Mont des Arts et des Sciences*: discours prononcés à l'inauguration de la Bibliothèque collective des sociétés savantes, le 16 décembre 1907. IIB Publication No. 90; Bruxelles: IIB, 1908; and in *Annuaire de la Belgique scientifique, artistique et littéraire*, IIB Publication No. 77; Bruxelles: IIB, 1908, pp. 11-22.]

La Bibliothèque Publique: Revue bimestrielle pour l'amélioration et le développement des bibliothèques publiques 1908 - ? [Note: edited by Oscar Grojean, Henri La Fontaine, Paul Otlet and Louis Stainier.]

"Assemblée générale [rapport sur la situation morale de l'Union] *Bulletin officiel de l'Union de la presse périodique belge* 17 (March 1908): 64-67.

Conférence internationale de bibliographie and documentation. [IIB Publication 103a]; Bruxelles: Imprimerie Polleunis et Ceuterick, 1908. 34pp. (Extrait du *Mouvement sociologique international* 9^e année, No. 4, December 1908.)

La Fontaine, Henri and Paul Otlet, "L'Etat actuel des questions bibliographiques et l'organisation internationale de la documentation," *IIB Bulletin* 13 (1908): 165-191. [Also published in *Actes de la conférence internationale de bibliographie et de documentation, Bruxelles, 10 et 11 juillet, 1908: Première partie*. Publication no. 98; Bruxelles: IIB, 1908, and as document No. 10["marked number 6 by mistake"] of the IV^e Conférence internationale de bibliographie et de documentation].

"La Documentation en matière administrative, aperçu général," *IIB Bulletin* 13 (1908): 342-348. [Also in *Actes de la conférence internationale de bibliographie et de documentation, Bruxelles, 10 et 11 juillet, 1908*. IIB Publication No. 98; Bruxelles: IIB, 1908, pp. 147-154; and in *La Revue communale de Belgique*, November 1908, pp. 339-334.]

L'Office International de Bibliographie "*Le Movement scientifique en Belgique, 1830-1905*; Vol 2; Bruxelles: no publisher, [1908] 22 pp.

La Fontaine, Henri, Paul Otlet, and Louis Masure, eds, *Annuaire de la Belgique scientifique, artistique et littéraire*. Publication No. 71; Bruxelles: IIB, 1908.

"Au Feu!" *La Chronique*, 9 September 1908.

"A la Bibliothèque Royale, Chez M. Paul Otlet," *La Chronique*, 16 November 1908.

"[L'Allocution du président] quatrième Congrès de la presse périodique belge, Bruxelles, 14 novembre 1908," *Bulletin officiel mensuel de l'Union de la presse périodique belge* 19 (March- April 1910): 42-47.

"Une 'Utopie' post-scolaire: La 'Chautauqua Institution' aux Etats-Unis," *Bulletin mensuel de la fédération post-scolaire de Saint-Gilles*, 4 Ser. 7 (1908): 663-665.

La Fonction et les transformations du Livre. Résumé de la conférence faite à la Maison du livre, 14 novembre 1908. Musée du Livre Publication no. 11; Bruxelles: Musée du Livre, 1909. 33 pp. [also in *Musée du Livre* 2 Fasc 7/8 (December 1908): 83-91.]

"Assemblée générale du dimanche, 28 février 1909 [Rapport and discussion]," *Bulletin officiel mensuel de l'Union de la presse périodique belge* 18 (May-June 1909): 54-67.

1910 to 1914, The Outbreak of War

"L'Organisation Internationale et les associations internationales," *Annuaire de la vie Internationale, 1908-1909.* 2^e série, t.1; Bruxelles: Office Central des Institutions Internationales, 1909. pp. 29-166. [also published as Report No.1; Congrès des Associations Internationales, Bruxelles; n.d. [1910]. 138pp.]

"L'Organisation de la vie internationale," *Vie Intellectuelle* 2^e année, t.4 (1909): 208-219.

"La Presse périodique à l'exposition de Bruxelles", *Bulletin officiel mensuel de l'Union de la presse périodique belge* 19 (January - February 1910): 1-4.

Les Transformations du périodique: revues spéciales, revues documentaires, revues internationales[Report for] Deuxième Congrès international de la presse périodique 24-26 Juillet, 1910. Bruxelles: Secrétariat-Général, 1910. 8pp.

"Assemblée générale du 20 février 1910 ["Allocution" of the President with discussion]," *Bulletin officiel mensuel de l'Union de la presse périodique belge* 19 (July - August 1910): 114-120.

"Le Congrès mondial des associations internationales et la codification internationale du droit privé," *Revue de l'Institut de droit comparé* 3 (1910):305-311.

"Le Code universel des règles catalographiques," *Congrès internationaux des archivistes et bibliothécaires. Congrès de Bruxelles, 1910, Actes.* Bruxelles: Siège de la commission permanente des Congrès internationaux des archivistes et bibliothécaires, 1912, pp. 375-377.

L'Organisation internationale et les associations internationales. Rapport No.1, Congrès des Associations Internationales, Bruxelles, 1910; Bruxelles: Office Central des Associations Internationales, 1910. 138 pp.

"Marché proposée pour les travaux," *Congrès mondial des associations internationales, première session 1910. Actes: documents préliminaires, rapports, procès-verbaux, code.* Publication No. 2; Bruxelles: Office Central des Associations Internationales (1913). pp. 893-9[i.e. 8]98.

"L'Organisation internationale et les musées," *Actes du Congrès mondial des associations internationales, Bruxelles, 1910.* Publication no. 2A; Bruxelles: Office Central des Associations Internationales, 1913. pp. 1207-1211.

"Le Deutsche Buchgewerberein' et le Musée du Livre de Leipzig," *Le Musée du Livre*, Fasc. 16 (1910): 200-206.

"Le Musée du Livre et la Maison du Livre," *La Librairie*, 15 November 1910.

"Sur l'Exposition," *Durendal* 17 (1910): 503-508.

"Le Langage scientifique et technique: analyse et synthèse du concept: définition, terminologie, classification, notation, schémas: (Extrait du rapport présenté au Congrès de comptabilité, Charleroi, 1911)," *Revue de l'ingénieur et index technique* 19, no. 2 (1911): 5-7.

"Le Musée international et les sciences géographiques," *Bulletin de la Société Royale Belge de Géographie* 36 (1911): 452- 458.

"Pour la sauvegarde du Vieux-Bruxelles," *Art moderne* No. 1, 31 (1911): 4.

"Rapport présenté à Monsieur le marquis Cappelli, président de l'Institut International d'Agriculture," Annexe A à *Rapports sur la bibliographie*. Rome: Institut International d'Agriculture, 1911. pp. [3], 1-59.

"Livre microphotographique: le bibliophôte ou livre à projection," *Bulletin officiel de l'Union de la presse périodique belge* 20 (September - October 1911): 197-205 [Note: this article is unsigned].

"L'Avenir du livre et de la bibliographie," *IIB Bulletin* 16 (1911): 275-296. [Also published separately as IIB Publication no. 117 and in *Bibliothèques, livres et librairies*: Paris: Association des bibliothécaires français, 1912. pp. 47-74. Part III of this paper "les Sciences du livre," was translated into Russian by A.P. Kazanskii and published as "Bibliograficheskia nauka," *Bibliograficheskia izvestiia* 6, Nos 3-4 (1918):65-70.]

La Fontaine, Henri and Paul Otlet, "La Vie internationale et l'effort pour son organisation," *La Vie internationale* 1 (1912): 9-34.

"Assemblée générale du dimanche, 25 février 1912 [Rapport annuel]," *Bulletin de l'Union de la presse périodique belge* 22 (July-August 1912): 107-114.

"Les Périodiques et le mouvement international," *Bulletin officiel de l'Union de la presse périodique belge* 23 (March- April 1913): 33-40. (Extrait de la Vie internationale t.4, 1912.)

"Assemblée générale statutaire du dimanche, 23 février [Rapport]," *Bulletin officiel de l'Union de la presse périodique belge* 23 (March-April 1913): 45-52.

H. La Fontaine and Paul Otlet "Central Office of the International Associations(Brussels) [Letter to Mr. Hendrik C. Andersen February 28, 1912] in "World Conscience": An International Society for the Creation of a World Centre. Rome: Communications Office, Hendrik C. Andersen, March 1913. pp 10-11.

La Fontaine, Henri and Paul Otlet, *Congrès mondial des associations internationales. Compte-rendu sommaire de la deuxième session, Gand-Bruxelles, 15-18 Juin 1913*. UIA Publication No. 56; Bruxelles: Office Central des Associations Internationales, 1913. pp.

5-40. [Also published as "Deuxième session du Congrès mondial" in *La Vie internationale* 3 (1913): 489-504.]

H. La Fontaine and Paul Otlet, "Introduction". *Congrès mondial des associations internationales, Bruxelles, 15-18 Juin 1913 [Proceedings]*. UIA Pub. 46; Bruxelles: Office Central, Union des Associations Internationales, 1914. pp I-XXXVI.

Le Livre dans les sciences. Conférence faite à la Maison du Livre. *Musée du Livre*, fasc 25-26 (1913): 379-389.

Le Musée international et l'enseignement: conférence faite devant le personnel enseignant. Office central des associations internationales Publication No. 61; Bruxelles: Musée International, 1913. 11 pp.

L'Organisation internationale de la science: trois conférences données à la Faculté Internationale de Pédologie en mars 1914 (Notes recueillies par L. Jacob, étudiant à la Faculté). Bruxelles: Imprimerie Rossel et Fils, 1914. 16 pp. ("Extrait de *La Revue psychologique*, 7, Fasc. 2, 1914.")

"Sur le timbre-poste," *Catalogue de l'Exposition internationale du timbre-poste moderne du 7 Mars au 20 Avril 1914 à la Maison du Livre*. Bruxelles: Musée du Livre, 1914. pp. 3-16.

"Exposition de Leipzig," *Bulletin mensuel des imprimeurs de Bruxelles* 3 (June 1914): 19-25[with 3 unnumbered pages of illustrations of the buildings of the Exposition].

"Le Livre en Belgique: introduction du catalogue de la Section belge [de l'Exposition du livre belge à Leipzig]," *Musée du Livre*, Fasc. 29-30 (1914): viii-xviii.

"Comment ont grandi les villes américaines," *Expansion belge* 7 (June 1914): 346-354.

"Un projet grandiose de cité internationale," *Compte-rendu du premier Congrès international et exposition comparée des villes*, Gand, 1913; Section 1; Bruxelles: Union Internationale des Villes, 1914. pp. 79- 85.

De l'Organisation permanente à donner au Congrès des Villes," *Compte-rendu du premier Congrès international et Exposition Comparée des Villes...* Section 11, pp. 129-138 [Note: This is signed "Secrétariat Général: Otlet was one of 3 Secretaries General; his responsibility was Exhibitions.]

"L'Organisation de la documentation administrative" *Compte-rendu du premier Congrès international et exposition comparée des villes...* Section 11, pp 139-146 [Note: Also published in *IIB Bulletin* 19 (1914): 44-51 and as IIB publication No. 125].

[La Fontaine, Henri, Paul Otlet and E. Vinck,] "Exposition urbaine internationale de Lyon, 1914: participation des associations internationales. Conférence relative à la coopération des associations internationales à l'étude des questions urbaines, organisée par l'Union internationales des villes et l'Union des association internationales, Lyon 19-20 Septembre 1914." *Le Mouvement communal* 1(May 1914):94-96.

[La Fontaine, Henri and Paul Otlet], *The Union of International Associations: A World Centre*. Publication No. 60; Bruxelles: UIA Union des Associations Internationales Office Central, 1914.

1914 to 1918, Peace

La Fin de la guerre: traité du paix général basé sur une charte mondiale déclarant des droits de l'humanité et organisant des états l'Union. Publication No. 86; Bruxelles: UIA and the Hague: Nijhoff, 1914. 159 pp.

Traité de paix général. Charte mondiale déclarant les droits de l'humanité et organisant la confédération des états: Projet. Bruxelles: UIA, October 1914, 21 pp. (Extrait de *La Vie internationale*, Numéro de la guerre en préparation, Octobre 1914.)

The End of the War and the Establishment of a World Charter. Translated by Ada Cunningham. Women's Union for Peace, Foreign Leaflet No. 5; London: The Union, [1914]. [6] pp.

"Déclaration des droits des nationalités (projet)," *Conférence des nationalités. Compte-rendu sommaire. . .* Publication No. 6; Paris: Union des Nationalités, 1915. pp. 15-18.

"La Supresión de la guerra por la Confederación mundial de los estados. Proyecto de Constitucion mundial del señor Paul Otlet," *Boletin mensual del Museo social argentino* 4 (March- April 1915): 153-179. [Note: "Extracto por E.J.J.B. [ie. Biraben] del Libro, "La Fin de la guerre. . . "]

Une Constitution internationale: projet présenté à la Ligue (résumé). Publication No. 3; Paris: Ligue pour une Société des Nations basée sur une constitution internationale, May 1916. 8 pp.

Mesures concertées à prendre par les états: L'Exécutif international. Congrès international d'études, Berne, 1916; La Haye: Nijhoff (for Organisation Centrale pour une Paix Durable), 1916, 31 pp.

A World Charter Organising the Union of States, translated by Ada Cunningham. St. Andrews, N.B.: Women's Union for Peace, [1916?]. 31 pp.

"Les Peuples et les nationalités: Problèmes généraux, solutions générales: Introduction aux travaux de la Commission [Permanente de la Conférence des nationalités] (à Suivre)," *Les Annales des nationalités* 5, Nos 1-3 (1916): 16-31.

Les Peuples et les nationalités. Lausanne: Union des Nationalités, 1916. 6pp.

Les Problèmes internationaux et la guerre: tableau des conditions et solutions nouvelles de l'économie, du droit et de la politique. [UIA Publication No. 50]; Genève: Librairie Kundig; and Paris: Rousseau et Cie, 1916. 501 pp.

Constitution mondiale de la Société des Nations: le nouveau droit des gens. [UIA Publication no 51 bis]; Geneva: Editions Atar; and Paris: Editions G. Crès et Cie, 1917. 253 pp.

"Société des Nations et constitution internationale," *La Patrie Belge*, 21 January 1917

"L'Amérique et nous," *La Patrie belge*, 15 April 1917.

Charte mondiale organisant la Société des Nations. Paris: Imprimerie Centrale de la Bourse, June 1917. 20 pp.

"Qu'est-ce que la Société des Nations: autre congrès prochain," *L'Oeuvre*, 24 June 1917

"La Société des Nations," *La Patrie belge*, 30 June 1917

"Le pape, La Belgique et la Société des Nations", *La Patrie Belge*, 1 September 1917.

"La Reconstruction de la Belgique," *La Patrie belge*, 6 October 1917.

"La Documentation au service de l'invention," *Eureka*, October 1917, pp. 5-8.

"Constitution et constituante mondiale," *La Patrie belge*, 24 November 1917

"L'Institut International de Bibliographie," *Bibliographie de la France-2^e Part: chronique*, 106 année, 2^e série (14 Décembre 1917): 242-244.

"Les Précédents de la Société des Nations," *Bulletin officiel de la Ligue des droits de l'homme* 17 (November 1917): 666-668. [Note: Articles in the first part of this issue were also published separately as *L'Organisation de la Société des Nations*. Paris: Ligue des Droits de l'Homme et du Citoyen, 1917. Otlet's paper appears on pp. 72-73.]

L'Information et la documentation au service de l'industrie. Paris: Typographie Philippe Renouard, 1917. 33 pp. ("Extrait du *Bulletin de mai-juin 1917* de la Société d'Encouragement pour l'industrie nationale.")

"La Politique belge et l'avenir des neutralités" (no publisher or place [1917?]), 8pp.

Projet de charte mondiale. Publication no. 26; Lausanne: Union des Nationalités, Office Central, 1917. 24 pp.

"L'Avenir du catalogue international de la littérature scientifique," *Revue générales des sciences pures et appliquées* 29 (1918): 71-75.

Les Moyens de documentation en France: bibliothèques, catalogues et bibliographies, offices de documentation. IIB Publication No. 130; Paris: IIB, Bureau de Paris and "Editions et Librairie" Etienne Chiron, [1918?]. 43 pp.

"Bibliograficheskia nauka" *Bibliograficheskia izvestia* 6, Nos 3-4 (1918): 65-70 [Part III, "les Sciences du livre" of "L'Avenir du livre et de la bibliographie," 1911. Translated by Prof. A.P. Kazanskii.]

"Après le discours de Lloyd George: Le monde et la Belgique," *La Patrie Belge*, 13 January 1918.

"Déclaration complétant la Déclaration des droits de l'homme en organisant la Société des Nations," *La Société des Nations*, 2 February 1918

"Pour et contre La Société des Nations," *La Patrie belge*, 17 February 1918.

"La Leçon économique de Brest-Litovsk," *La Patrie belge*, 28 February 1918.

"Transformations opérées dans l'appareil bibliographique des sciences," *Revue scientifique* 58 (April 1918): 236-241.

"Sur l'Avenir économique, I", *La Patrie belge*, 16 June 1918 [and] "II", 27 June 1918.

"De l'Utopie à la réalité: un processus possible pour arriver à la Société des Nations," *La Société des Nations*, 6 July 1918

"La Finance après-guerre," *La Patrie belge*, 11 and 18 August 1918.

"La Société des Nations s'approche," *La Société des Nations*, 1 September 1918.

"Le Traitement de la littérature scientifique," *Revue général des sciences pures et appliquées* 29 (September 1918): 494-502.

"La Société des Nations", *La Patrie belge*, 27 October 1918.

"The Book - in World-Wide Use and International Co-ordination After the War," *Library Journal* 43 (November 1918): 790- 792.

"Programme de politique mondiale pour l'après-guerre," *La Patrie belge*, 15 December 1918.

"Intérêts économiques franco-belges," *La Patrie belge*, 22 December 1918.

1919 to 1924,

The Affair of the Palais Mondial

"Les Noirs et la Société des Nations," *La Patrie belge*, 19 January 1919.

La Société des Nations. Conférence donnée à Genève et à Lausanne, les 21 et 22 janvier 1919. Lausanne: Edition de la *Revue romande*, 1919. pp. 5-17.

"Sur la capitale de la Société des Nations," *La Revue contemporaine*, n.s. No. 26 (25 January 1919): 41-52.

La société intellectuelle des Nations. Bologna: Nicola Zanichelli; London: Williams and Norgate; Paris: F. Alcan, 1919. 11 pp. ("Extrait de *Scientia*, vol. 25, January 1919.")

"L'Afrique et la Société des Nations," *La Patrie belge*, 16 February 1919.

"Vers une charte économique de la Société des Nations," *La Patrie belge*, 23 February 1919

"L'Organisation des travaux scientifiques: conférence faite à Paris le 25 février 1919." Paris, Secrétariat de l'Association Française pour l'Avancement des Sciences, 1919. p. 5-40. ("Extrait du *Volume des conférences de l'Association*.")

"Les Associations internationales et la reconstitution de l'après-guerre," *Revue générale des sciences pures et appliquées* 30 (28 February 1919): 114-119.

"Préface," *Pour la reconstruction des cités industrielles: Etude économique et sociale*. par A. Duchêne. Paris: Bibliothèque de la Renaissance des Cités, 1919. pp. 7-15.

"Reconstruction de la Belgique," *La Patrie belge*, 9 March 1919

"Une Capitale internationale," *Le Mouvement communal*, No. 2, 15 March 1919, pp. 18-21.

"Réforme industrielle et sociale," *La Patrie belge*, 16 March 1919.

"La Sociologie municipale," *Le Mouvement communal*, No. 6, 15 May 1919, pp. 70-72 [Note: Preface by Paul Otlet to a work now being published: A Duchêne, *Pour la reconstruction des nos[sic] villes industrielles.*]

"Les Villes et la guerre" *Mouvement communal* No 6, 15 May 1919, p.86 [Note: a brief paragraph.]

"L'Union internationale des villes devant les problèmes nouveaux," *Le Mouvement communal*, Nos 9-10, July 1919, pp. 136-138.

"Classification Comparée," *Revue de l'ingénieur et index technique* 25 (September-October 1919): 93-104.

"La Documentation des communes," *Le Mouvement communal*, No. 13, October 1919, pp. 174-177.

L'Organisation de la documentation internationale et le rôle des associations de chimie; communication présentée à la Conférence interalliée de la chimie, le 15 avril 1919. *Publications de Chimie et Industrie;* Paris: Société de Chimie Industrielle, 1919. 8 pp.

Sur l'Etablissement en Belgique du siège de la Société des Nations. Bruxelles: [UIA], November 1919. 35 pp.

"Le siège de la Société des Nations," *L'Indépendance belge*, 1 December 1919 [Note : a brief report on "Sur l'Etablissement en Belgique de la Société des Nations" by Paul Otlet for which see above].

"La Cité internationale: elle doit être érigée en Belgique," *Demain*, 10 December 1919.

Centre Intellectuel Mondial au service de la Société des Nations. UIA Publication N. 88; Bruxelles: UIA, 1919. 28 pp.

"Le Bilan des nations: désordre, incohérence, vertige, désorientation," *Demain*, 5 January 1920.

"Les Causes naturelles et le pourquoi des guerres?" *Demain*, 5 February 1920.

Sur la création d'une université internationale: Rapport présenté à L'Union des Associations Internationales. Publication No. 90; Bruxelles: UIA, February 1920. 39 pp.

L'Organisation internationale de la bibliographie et de la documentation. IIB Publication No. 128; Bruxelles: Palais Mondial (Cinquantenaire), August 1920. 44 pp.

"La Tâche de l'Assemblée de Genève," *L'Indépendance belge*, 15 November 1920

[La Fontaine, Henri and Paul Otlet]. Sur L'Organisation internationale du travail intellectuel à créer au sein de la Société des Nations: Rapport et voeu présentés par L'Union des associations internationales. P.No.95; Bruxelles: Imprimerie Oscar Lamberty, November 1920. 20pp.

"La Belgique et les initiatives internationales," *Demain*, 10 March 1921.

La Fontaine, Henri, and Paul Otlet, "International Associations of Various Types." *The League of Nations Starts: An Outline by its Organisers*. Chapter 13; London: Macmillan and Co., 1920. pp. 201-209.

La Fontaine, Henri and Paul Otlet, *Organisation internationale du travail intellectuel*. UIA Publication No. 97; Bruxelles: Palais Mondial, June 1921. 19 pp.

La Documentation en agriculture: rapport sur la mission à l'Institut International d'Agriculture. [IIB Publication No. 132a;] Rome: Imprimerie de l'Institut International d'Agriculture, 1921. 107 pp.

[La Fontaine, Henri and Paul Otlet], "Les Conceptions et le programme de l'internationalisme," *La Vie internationale* Fasc 26, No 1 post bellum (November 1921): 99-110.

[La Fontaine, Henri and Paul Otlet], "Le Centre international installé à Bruxelles au Palais Mondial," *La Vie internationale*, Fasc 26..., pp. 111-136. [Note: Neither of the above two articles is signed but La Fontaine and Otlet are shown as Editors-in-Chief of the journal - no further issue was published. No other indications of authorship are given.]

"La Quinzaine internationale de 1921: Rapport sur les travaux," *La Vie internationale*, Fasc 26 ..., pp. 137-144.

L'Exposition universelle de 1930 en Belgique et l'établissement d'une cité internationale. Rapport à l'Union des Associations Internationales et à l'Union Internationale des Villes. Union des Associations Internationales Publication No. 103; Bruxelles: Palais Mondial, n.d. [1921], 8 pp. [Note: Also published in *Le Mouvement communal* No. 11, November, 1921 pp. 199-206.]

"Projet d'association nationale des bibliothèques de Belgique," *Le Mouvement communal* No. 6, June 1922, pp. 123-124.

Introduction aux travaux de la Commission de coopération intellectuelle de la Société des Nations. Publication No. 105; Bruxelles: UIA, 1922. 20 pp.

"Exposé de M. Paul Otlet," *Conférence pour le développement des institutions du Palais Mondial, Bruxelles, 20 au 22 août 1922, Annexe D: Exposé et discours*. UIA Publication No. 106; Bruxelles: Palais Mondial, 1922. pp. 8-13.

Otlet, Paul and Léon Wauters, *Resumé du cours préparatoire aux examens du bibliothécaire*. Syllabus du cours de l'Ecole centrale de service social. Bruxelles: Le Service Social, [1922]. 127 pp. [Note: A revised and expanded edition was published in 1923 as *Manuel de la bibliothèque publique*. and a third edition in 1930]

"L'Organisation internationale du livre, de la bibliographie et de la documentation," *Procès-verbaux et mémoires du Congrès international des bibliothécaires et des bibliophiles tenu à Paris du 3 au 9 avril 1923*: Paris: Jouve et cie, 1925. pp. 287-295.

"La Presse périodique," *Bulletin officiel d'Union de la presse périodique belge* 23 (September-October 1923): 149-151.

"Le Musée international de la Presse: La documentation par et pour la presse," *ibid*, pp. 211-219.

"La Cité internationale: La prochaine exposition serait l'occasion de la réaliser," *ibid* pp. 231-234. [Note: Other articles in this issue of the *Bulletin officiel* are unsigned but it seems likely that several are by Otlet, especially those on le Musée du Livre, Le Palais Mondial, and Le Centre International (with illustration and diagrams).]

Manuel de la documentation administrative: principes généraux. Rapport présenté au 2^e Congrès international des sciences administratives, Bruxelles, 1923. IIB Publication No. 137 and l'Union des Villes et Communes belges Publication No. 21; Bruxelles: Palais Mondial, 1923. 95 pp.

Otlet, Paul and Leon Wauters. *Manuel de la bibliothèque publique*. 2^e ed; Union des Villes et des Communes belges Publication No. 17, IIB Publication No. 133; Bruxelles: Palais des Beaux Arts, 1923. 174 pp. [Note: A third edition was published in 1930.]

La Société des Nations et l'Union des associations internationales: Rapport aux Associations sur les premiers actes de la Commission de coopération intellectuelle. UIA Publication No. 107; Bruxelles: Palais Mondial, 1923. 28 pp.

[Otlet, Paul, comp], *Les Titres du Palais Mondial: actes, état statistique, témoignages*. Deuxième mémorandum sur les rapports avec le gouvernement belge. UIA Publication No. 110; Bruxelles: Palais Mondial, September 1923. 32 pp.

[Otlet, Paul, comp], *Le Conflit du Palais Mondial*: Appel des amis et coopérateurs belges du Palais Mondial. UIA Publication No. 111; Bruxelles: Union des Associations Internationales, January 1924. 12 pp.

[Otlet, Paul, comp.], *L'Affaire du Palais Mondial. Documents*. UIA Publication No. 112; Bruxelles: UIA, March 1924. 82 pp. [Note on the title page: "Le 11 février 1924, le conflit avec le gouvernement belge s'est dénoué par l'expulsion de force des Associations Internationales (On the 11th February 1924, the conflict with the Belgian Government culminated in the forcible removal of the International Associations")]

"Rapport général présenté par l'Union des associations internationales," *Conférence des Associations Internationales, Genève, 8 septembre 1924*. Publication No. 113. Bruxelles: UIA 1924. pp. 3-64.

1925 to 1931, International Institute for Documentation

Goldschmidt, Robert B. and Paul Otlet, *La Conservation et la diffusion internationale de la pensée: le livre microphotique*. Publication No. 144. Bruxelles: IIB, 1925. 8 pp.

"L'Institut International de Bibliographie [with abstract and discussion]," Association of Special Libraries and Information Bureaux. *Report of Proceedings of the Second Conference, Balliol College, Oxford, September 25-28, 1925*. London: ASLIB, 1926. pp. 25-36.

"Les récentes transformations du livre et ses formes futures," *Gutenberg Festschrift zur Feier des 25 jaehrigen Bestehens des Gutenberg*. Mainz: Verlag der Gutenberg Gesellschaft, 1925. pp. 23-28.

L'Avenir de la comptabilité et ses rapports avec les besoins de l'organisation mondiale. [Rapport à] V^e Congrès international de la comptabilité. Bruxelles: Imprimerie lithographique, "La Senne," 1926. 23 pp.

"Notes sur le livre et les bibliothèques en Belgique," Congrès international des bibliothécaires et des amis du livre, Prague, 1926, *Procès-verbaux et mémoires*. Prague: Imprimerie d'Etat, 1928. pp. 456-465.

"Le Répertoire bibliographique universel et l'oeuvre coopérative de l'Institut International de Bibliographie," Congrès international des bibliothécaires et des amis du livre, Prague, 1926. *Procès-verbaux et mémoires*. Prague: Imprimerie d'Etat, 1928. Pp. 439-455. (Also published in 1907 as IIB Publication No. 153)

L'Education et les instituts du Palais Mondial (Mundaneum): 1. Centre-Musée International de l'Enseignement; 2. Education et Synthèse Universaliste. UIA Publication No. 121. Bruxelles: Palais Mondial, 1926. 28 pp.

"La Politique et le plan d'évolution," Congrès psychosociologique, 30 Mai-6 Juin 1926 Paris. Section VII: La Suprapolitique - Thème: Le plan de l'évolution de l'humanité social et supranational. [Roneoed typescript (Peace Palace Library, the Hague)], 3pp.

"Un Service intercommunal de radiophonie, *Le Mouvement communal*, No. 55, 24 April 1926, pp. 436-438.

"Les Elections communales," *Le Mouvement communal*, No. 63, 15 September 1926, pp. 555-556.

"Les Voies nouvelles de l'administration et de l'organisation," *Le Mouvement communal*, No. 64, 30 September 1926, pp. 574-579.

L'Etat actuel de l'organisation mondiale de la documentation: communication présentée au sixième Congrès de chimie industrielle, 26 septembre-2 octobre, 1926. [IIB Publication No. 135;] Paris: *Chimie et Industrie*, 1926. 7 pp. ("Extrait des Comptes-Rendus du sixième congrès de chimie industrielle.")

"Ordre et clarté dans les archives courantes," *Le Mouvement communal*, No. 69, 15 December 1926, pp. 669-672.

Pour une monnaie internationale: le franc postal universel. UIA Publication No. 120; Bruxelles: Office de Publicité, Société Coopérative; and Paris: Marcel Rivière, Librairie des sciences politiques et sociales, 1926. 48 pp.

Le Siège définitif de la Société des Nations et une cité mondiale: centre autonome et extraterritorialisé des organismes internationaux. UIA Publication No. 119; Bruxelles: Palais Mondial, 1926. 8 pp.

"Léopold II et nos villes," *Le Mouvement communal*, No. 72, January 30 1927, pp. 17-20.

"Une petite commune: Hoeylaert," *Le Mouvement communal*, No. 85, 15 September 1927, pp. 221-223.

"Préface", *Les Transformations morales et sociales de la Chine depuis la revolution de 1911*, by T.M. Hou. UIA Publication No. 122; Bruxelles: UIA, 1927. pp. 9-17.

Le Répertoire bibliographique universel et l'oeuvre coopérative de l'Institut International de Bibliographie. Publication No. 153; Bruxelles: IIB, 1927. 11 pp. [Note: this was presented to the Congrès international des bibliothécaires et des amis du livre, Prague 28 Juin au 3 Juillet, 1926: *Procès-verbaux et mémoires*. Prague: Imprimerie de l'Etat, 1928. pp.439-455.

"Exposé général du Mundaneum," *Mundaneum: Le Centre mondial, scientifique, documentaire et éducatif, au service des associations internationales, qu'il est proposé d'établir à Genève pour compléter les institutions de la plus grande Société des Nations et commémorer en 1930 dix années d'efforts vers la paix et la collaboration*. UIA Publication No. 128; Bruxelles: Palais Mondial, 1928. pp. 1-28. [Note: Part II, "Le Projet architecturel," is by Le Corbusier and Pierre Jeanneret.]

Institut International de Bibliographie. IIB Publication No. 155. Bruxelles: Palais Mondial, 1928. 36 pp. [Note: sections B. "Sur la Bibliothèque Mondiale," pp. 21-25 (which was also printed separately as IIB Publication no. 154), and C., "Sur l'Encyclopédie," pp. 25- 28 are signed by Otlet. Section A., "Sur le Répertoire Bibliographique Universel" pp. 18-21, and the earlier matter are unsigned.]

Sur la Bibliothèque Mondiale. IIB Publication No. 154; Bruxelles: Palais Mondial, 1928. 4 pp. [This also appeared as part of *Institut International de Bibliographie*, 1928, above.]

Otlet, Paul and Anne Oderfeld, *Le Matériel didactique:: Rapport préliminaire présenté à la Commission internationale pour le matériel didactique*. Publication No. 127; Bruxelles: UIA, 1928. 8 pp.

Otlet, Paul and A. Oderfeld, "Les Communes et la réalisation de l'enseignement. Rapport préliminaire présenté à la Commission internationale pour le matériel didactique", *Le Mouvement communal*, No. 91, 3 January 1928, pp. 346-352.

"Der grössere Völkerbund" *Das werdende Zeitalter* 7, Heft 7/8(1928) [offprint of 4 unnumbered pages].

"Genève: Cité internationale, *Le Mouvement communal*, No. 92, 29 February 1928, pp. 359-364.

"Cologne et Pressa ou l'étape nouvelle d'une antique cité," *Le Mouvement communal*, No. 97, July 1928, pp. 643-646.

"Les Communes et le centenaire," *Le Mouvement communal*, No. 98, 31 August 1928, pp. 659-663.

"Report from M. P. Otlet on behalf of l'Institut International de Bibliographie," Association of Special Libraries and Information Bureaux, *Report of the Proceedings of the Fifth Conference, New College, Oxford, September 14-17, 1928*. London: ASLIB, 1928. pp. 123-4.

L'Année bibliographique. Paris: *Chimie et Industrie*, 1929. 5 pp. ("Extrait de *Chimie et Industrie*, Vol. 21, Juin 1929.")

La Banque internationale. Economie mondiale et société financière des nations. Etudes politiques et sociales no. 15; Bruxelles: L'Eglantine, 1929. 208 pp.

Cité mondiale à Genève: World Civic Center: Mundaneum. Avec des plans de Le Corbusier et de Pierre Jeanneret. Publication No. 133; Bruxelles: UIA, 1929. 36 pp.

"The International Organisation of Information Services [and Discussion on paper]," Association of Special Libraries and Information Bureaux, *Report of the Proceedings of the Sixth Conference, Trinity College, Cambridge, 1929.* London: ASLIB, 1929. pp. 156-159.

"Klassifikatsiia biblioteki Kongressa," *Bibliograficheskia Izvestia* 17, nos. 1-2 (1929): 17-22.

Otlet, Paul and Anne Oderfeld, *Atlas de la civilisation universelle:* conception, organisation, méthodes de la préparation du matériel didactique en coopération internationale. Commission Internationale du Matériel Didactique, Publication No. 2; UIA Publication No. 132; Bruxelles: Palais Mondial, 1929. 23 pp.

"1. Rapport sur l'Institut International de Bibliographie présenté au Congrès international des bibliothèques et de la bibliographie, Rome, 15 juin 1929. Document; IIB Publication no. 159. Bruxelles: Palais Mondial, 1929. pp. 1-4. [Note: II is by F. Donker Duyvis, "Commission internationale de classification décimale, Rapport sur la deuxième édition complète de la classification décimale."]]

Otlet, Paul and Léon Wauters, *Manuel de la Bibliothèque publique.* 3^e édition. IIB Publication No. 133, Union des villes et des communes belges Publication No. 17; Bruxelles: Institut International de Bibliographie and l'Union, [1930]. 171 pp.

"Bruxelles, vraie capitale," *Le Mouvement communal*, No. 116, February 1930, pp. 378-379.

"L'Urbaneum - Bruxelles, Cité mondiale; Bruxelles, Grande Ville; Bruxelles, Capitale de la Belgique" *La Cité* 9(1931): 121-129.

Sur les possibilités pour les entités administratives d'avoir à tout moment leur situation présentée documentairement: rapport au IV^e Congrès international des sciences administratives, Madrid, 1930. IIB Publication No. 162; Bruxelles: Palais Mondial, 1930. 29 pp.

"Rapport du Secrétariat Général à la IX^e Conférence internationale de l'IIB, Zurich, 21-23 août 1930," *Documentatio Universalis*, Nos. 1-2 (1931): 32-43.

"La Bibliologie en Russie soviétique," *Documentatio Universalis*, Nos. 1-2 (1931): 76-79.

"Le Monument du centenaire de la Belgique: le Mundaneum - la Belganeum," *Palais Mondial*, No. 16 (March 1931): 5-8.

[Otlet, Paul.] "La Jeunesse et le Palais Mondial" *Palais Mondial*, No 16 (March 1931): 31-33.

"La Cité mondiale: demande présentée au gouvernement et au parlement de Belgique au sujet de la Cité Mondiale," *Palais Mondial*, No. 19 (Nov. 1931): 3-6. [Also issued separately as UIA Publication no. 138.]

P.[aul] O.[tlet], "Bibliographia Universalis: Observations et recommandations pour la publication des notices et des recueils bibliographiques," *Documentatio Universalis*, No. 3 (1931): 112-134. (Also published as IIB Publication No. 166.)

"Rapport du Secrétariat-Général: statistiques des collections, travaux et services au 31 décembre 1930; relevé des comptes de l'année 1930" *Rapports du X^e Conférence de bibliographie*, La Haye, 25-29 Août 1931. IIB Publication No. 177a; The Hague: IIB, 1931. pp. OT1-9.

"L'Année bibliographique. Conditions et caractéristiques générales de la bibliographie et de la documentation dans le monde. Résumé du Rapport de M. Otlet," *Rapports du X^e Conférence ... 1931* pp OT.

1932 to 1945,

The World City

"Institut International de Bibliographie, X^e conférence à La Haye du 25 au 29 août 1931" *Le Palais Mondial* No 20 (January 1932): 7-10.

"La Classification décimale et l'enseignement," *Palais Mondial* No. 20 (January 1932): 11-12.

La Banque mondiale et le plan économique mondial: les conditions et les conséquences de la crise. UIA Publication no. 137. Bruxelles: Editiones Mundaneum, Palais Mondial, 1932. 40 pp. [Also published in *La Vie économique*, Vol. 9, 1931].

[Otlet, Paul], *Classification décimale niverselle, études et projets: les subdivisions communes--rapport préliminaire*. IID Publication No. 169; Bruxelles: Palais Mondial, 1932. 91 pp.

"Systématique général du livre, de la documentation et des sciences bibliologiques: Proposition P. Otlet" *Vorträge der 11 Konferenz, Frankfurt a.M., 30 Aug.-3 Sept., 1932, International Institut für Dokumentation.* IIB Publication 178a; Bruxelles: Palais Mondial, 1932. pp. 32-36.

"Pour l'organisation de la documentation: les règles des publications, le système générale des publications, l'édition coopérative mondiale," *Vorträge der 11 Konferenz, Frankfurt a.M. 1932*, pp. 61-71.

"Questionnaire relatif au développement de l'Institut: annexe au rapport de M. Paul Otlet," *Vorträge der 11 Konferenz, Frankfurt a.M. 1932*, pp. 72-77.

"Les documents et la documentation: historique, conception, espèces, parties, fonctions, opérations," *Vorträge der 11 Konferenz, Frankfurt a.M. 1932*, pp. 108-111.

"Institut International de Documentation. Sur une terminologie systématique en matière de documentation: préliminaires," *Vorträge der 11 Konferenz, Frankfurt a.M. 1932*, pp. 112-113.

"Institut International de Documentation. Sur une terminologie systématique à base de terme documentaire," *Vorträge der 11 Konferenz, Frankfurt a.M. 1932*, pp. 114-115.

"L'Etablissement des documents: édition mondiale," *Documentatio Universalis*, Nos. 7-8 (1932): 263-268. [Note: This is followed by, "Annexe: La Systématique de la documentation" (an outline of topics), pp. 269-271, which is in turn followed by "1. La Bibliologie ou documentologie, sciences du livre et de la documentation. 2. Le livre et le document," pp. 272-309. These are described as "a first edition of part of the Systématique de la documentation which is now being published."]

"Le Problème," [introduction to] *L'Alimentation dans le monde*. UIA Publication No. 140; Bruxelles: Palais Mondial, 1932. pp. 1-3.

Programme mondial présenté à la considération des délégués aux conférences internationale de Lausanne et de Genève, 1932. UIA Publication no. 139; Bruxelles: Palais Mondial, 1932. 2 pp.

"Sur le développement ultérieur de la classification décimale," *Rapports de la XII Conférence, Bruxelles, 18-20 juillet 1933*. Publication No. 172a; Bruxelles: IID, 1933. pp. 1- 6.

"Réponse personnelle de M. Paul Otlet à l'enquête sur la documentation à l'Institut International de Coopération Intellectuelle," *Rapports de la XII^e Conférence, Bruxelles, 1933*. pp. 92-96.

"Desiderata de la documentation en matière photographique," *Rapports de la XII Conférence, Bruxelles, 1933*, pp. 128-129.

"Le livre photomicrographique," *IID Communicationes* 1, Fasc. 2 (1934): 19-20. [Note: "emprunté à *Documentatio Universalis*".]

"Le livre microphotographique: Notice sur les brevets Georges Sebille," *IID Communications*, 1 Fasc. 2 (1934): 21-23. (Note: unsigned and "emprunté à *Documentatio Universalis*")

Traité de documentation: le livre sur le livre. Théorie et pratique. Editiones Mundaneum, [IIB Publication No. 197;] Bruxelles: Palais Mondial, 1934. 431[+ 19] pp. [This was reprinted by the Centre de Lecture Publique de la Communauté Française in Liège and under the auspices of l'Association Internationale de Bibliologie in 1989].

"Henri La Fontaine," *IID Communications* 1, Fasc. 2 (1934): 2-5.

Constitution mondiale de la Société des Nations: Project 1934. UIA Publications No. 145; Bruxelles: Palais Mondial, 1934. 7pp.

"L'I.I.B - I.I.D. Hier, aujourd'hui, demain: Rapport de l'Institut - 40^e rapport annuel; Rapport du quarantenaire," *IID Communicationes* 2, Fasc. 4 (1935): Cols. Ot 1-12.

L'Exposition de Bruxelles et sa continuité en un grand centre international permanent," *Periodicum Mundaneum*, Fasc. 32 (August 1935), 8 pp.

"La Science et l'expertise. Rapport de M. Paul Otlet." 4^e Congrès d'Experts, 8-10 Septembre 1935. 10 pp. (typescript).

Monde. Essai d'universalisme: Connaissance du monde, sentiments du monde, action organisée et Plan du Monde. Editiones Mundaneum; Bruxelles: D. Van Keerberghen et Fils, 1935. 467 pp.

Plan Belgique: essai d'un plan général économique, social, culturel. Plan d'urbanisation national. Liaison avec le Plan mondial. Conditions, problèmes, solutions, réformes. Editiones Mundaneum; Bruxelles: D. Van Keerberghen et Fils, 1935. 170 pp.

"Rapport général 1936," *IID Communicationes* 3, Fasc. 4 (1936): Cols. Ot 1-4.

"Table ronde des associations internationales, Bruxelles 8-10 Juin 1935; L'Union des associations internationales et la Société des Nations; l'Exposition de Paris, 1937," *Periodicum Mundaneum* No. 33(January 1936):3-8.

"Réseau universel de documentation: Documentatio Universalis (Rete)," *IID Communicationes*, 4 Fasc. 1 (1937): 13-16.

"Introduction aux travaux du congrès," *Texte des communications, Congrès mondial de la documentation universelle, Paris, 16-21 août, 1937.* Paris: Secrétariat du Congrès, [1937]. pp. 251-258.

"Les Associations internationales et la documentation [with] Annexes. 1. Mesures d'organisation en Amérique, and, 2. L'Oeuvre de documentation de l'Union Académique Internationale," *Texte des communications, Congrès mondial de la documentation universelle, Paris, 1937,* pp. 259-268.

"Vœux Mundaneum pour la Noël 1937: message pour l'action en 1938," *Periodicum Mundaneum* fasc. 39 (January 1938): 1-2

"Rapport annuel général," *IID Communicationes* 5, Fasc. 3 (1938): 99- 100.

Otlet, Paul et ses collègues, *Belgium=Belganeum. Mundus=Mundaneum: à Bruxelles (Cinquantenaire), centre national de la vie intellectuelle; à Anvers (rive gauche), la Cité mondiale. Synthèse et plans.* Bruxelles: Editiones Mundaneum, 1942. 112 leaves. [Note: "Exemplaire No. 1 pour la Bibliothèque Royale (signed) Paul Otlet 1942-12-23."]

Otlet, Paul et ses collègues, *Atlas Bruxelles-Encyclopédie des connaissances relatives à la cité. Textes, illustrations, schémas, plans.* Edition photographique (Photocalque 7); Bruxelles: Editiones Mundaneum, 1944. 195 pp. [Note: "Le présent exemplaire a été photocalqué le 1944-03-07. Il porte le numéro 2 comme tirage provisoire. Il comprend notices et tableaux. Il est paginé de 1 à 195."]

Otlet, Paul et ses collègues. *Brusellaneum: Atlas des études et de la démonstration de l'Urbaneum-Bruxelles*. Bruxelles: Editiones Mundaneum, 1945. [193 pp.] [Note: Unpaged, in portfolio].

La Cité mondiale. Otletaneum Publication no. 1; Bruxelles: Editiones Mundaneum, 1945. n.p.

"M. H. La Fontaine, 1853-1943" *Periodicum Mundaneum*, Fasc. 49(January 1945):1-2 [Note: this reproduces Otlet's remarks to a gathering upon the death of La Fontaine. In parallel are reproduced the remarks of Georges Lorphèvre on the death of Otlet. Also included are several pages of extracts from letters of condolence.]

PAUL OTLET: BIBLIOGRAPHY OF SECONDARY SOURCES.

The Life and Work of Otlet

Baugniet, Jean. "Two Pioneers in the Sphere of International Cooperation and World Peace. Henri La Fontaine and Paul Otlet," *Union of International Associations, 1910-1970: Past, Present Future*. Brussels: UIA, 1970. pp.53-59.

Bradford, Samuel Clement, "Obituary: Henri La Fontaine and Paul Otlet," *British Society for International Bibliography Proceedings* 7(1945):16.

Canonne, André. "Otlet, La Fontaine et le Mundaneum" Avant-propos, *Traité de documentation Le livre sur le livre. théorie et pratique* by Paul Otlet. (Note: Reprint by the Centre de lecture publique de la Communauté française de Belgique (C.L.P.C.F.) of the 1934 edition under the auspices of l'Association Internationale de Bibliologie). Liège: C.L.P.C.F., 1989 pp viii-xvii.

Courtiau, Catherine "La Cité internationale 1927-1931," in *Le Corbusier à Genève 1922-1932*. Lausanne: Payot, 1987 pp. 53-69.

Courtiau, Catherine "L'Epopée de la Cité mondiale de Paul Otlet," *Lectures* No. 41 (1988): 13-17.

Donker Duyvis, F., "Paul Otlet", *IID Communications* 12, Fasc. 3/4(1945): 17-18.

Grolier, Eric de. "Paul Otlet pionnier de la documentation et de la coopération internationale," *Bulletin de l'Union française des organismes de documentation* (1945): 190-215.

Lophèvre, Christine. "Bibliographie des travaux de Paul Otlet relatifs à la documentation et à la bibliothéconomie." *Revue de la documentation* 21 (1954): 99-102.

Lorphèvre, Georges, "Henri La Fontaine (1854-1943), Paul Otlet (1868-1944)," *Revue de la documentation* 21 (1954): 89-92.

Lorphèvre, Georges, "Otlet, Paul," *Biographie Nationale*. Bruxelles: Académie Royale des sciences, des lettres et des beaux arts. t. 32 (1964): cols 545-558.

Nemoto, Akira. "The Compilation of the Répertoire Bibliographique Universel by the Institut International de Bibliographie, 1895 - 1914. *Library and Information Science* No 19(1981): 21-36 (text in Japanese with resumé in English).

Porrello, Oreste. "Dewey, Otlet, La Fontaine: tre pionieri della classificazione decimale," *Informatica e Documentazione* 9(March 1982): 40-48.

Rayward, W. Boyd. *The Universe of Information: The Work of Paul Otlet for Documentation and International Organisation*. FID Publication 520; Moscow: VINITI, 1975. 390 pp. (Also published in Russian as *Universum informatsii zhizn' i deiatel'nost'* Polia Otlet, 1976. 402 pp.).

Rayward, W. Boyd, "Paul Otlet," *ALA World Encyclopedia of Library and Information Services*. Chicago: American Library Association, 1980. pp. 368-369.

Rayward, W. Boyd. "The Times of Their Lives: a Personal Reflection on Biography and History." *Proceedings of the 4th Library History Forum*, Monash University, September 1989. Clayton, Victoria: Monash University Graduate School of Librarianship, 1990(in press).

Sagredo, Félix. "La bibliografía de Paul Otlet. El 'tratado de documentación' (1934) - Bibliografía (según Rayward y Lorphèvre)." *Documentación de las ciencias de la información* 8(1984): 13-25.

Uyttenhove, Pieter, "Les Efforts internationaux pour une Belgique moderne," *Resurgam: La reconstruction en Belgique après 1914*. Edited by Marcel Smets. Bruxelles: Crédit Communal de Belgique, 1985. pp. 33-68.

The FID and Documentation

Arntz, Helmut "International Federation for Documentation (FID)" *Encyclopedia of Library and Information Science* vol 12; N.Y.: Marcel Dekker, 1974.

Bradford, S.C. "Fifty Years of Documentation," *Documentation* by S.C. Bradford. Chapter VIII; London: Crosby Lockwood & Sons, 1953. [and other chapters on the Universal Decimal Classification].

Briet, Suzanne. *Qu'est-ce la documentation*. Paris: Editions documentaires industrielles et techniques, 1951.

Canonne, A. "Regards sur 'Mundaneum,' Classification décimale et C.L.P.C.F. [Centre de la lecture publique de la communauté française], *Lectures* 5(May-June 1985): 2-20.

Coblans, Herbert. *Librarianship and Documentation: an International Perspective*. London: Deutsch, 1974.

Comaromi, John. *The Eighteen Editions of the Dewey Decimal Classification*. Albany, N.Y.: Forest Press, 1976.

Dembrowska, Maria. "Problemy Dokumentacji i Informacji Naukowej ... Dokumentacja Według koncepcji P. Otleta," *Dokumentaiji i Informacija Naukowa*. Zansy Problematyki i Kierunki rozwoju (Documentation and Scientific Information: Problems and Trends). Warsaw: Stowarzyszeni Bibliotekarzy Polskich, 1965. pp.51-59.

Ditmas, E.M.R. Co-ordination of Information: A Survey of Schemes Put Forward in the Last Fifty Years," *Journal of Documentation* 3 (March 1948): 209-221.

De Grolier, Eric. *Théorie et pratique des classifications documentaires*. Paris, 1956 (carbon typescript, Library Association Library, London).

Donker Duyvis, F. "International Federation for Documentation," *Journal of Documentary Reproduction* 3 (September 1940): 176-190.

F. Donker Duyvis. *His Life and Work*. The Hague: Netherlands Institute for Documentation and Filing, 1964.

Falk, S. Steven, "The International Committee on Intellectual Cooperation: Its work for Bibliography." Unpublished MA thesis, University of Chicago Graduate Library School, 1977.

Farkas-Conn, Irene. "From Documentation to Information Science: The Origins and Early Development of the American Documentation Institute." Unpublished PhD. dissertation, Graduate Library School, University of Chicago, 1984.

"Festschrift for Paul Otlet," *Cahiers de la Documentation* 22, No. 4(1968): 95-116.

FID Publications: An 80 Year Bibliography, 1895-975. FID 531; The Hague: FID, April 1975.

Foskett, A.C. *The Universal Decimal Classification*. London: Bingley, 1973.

Harding, D.R. "Mundaneum: The International Library of Brussels after Four Years of German Occupation", *Library Association Record* 48 (February 1946): 40-42.

Mann, Margaret. "The Brussels Classification and Its General Use Abroad." *Special Libraries* 25 (March 1934): 51-54.

Metcalfe, John. *The Crisis in Subject Indexing and Synthetic Classification with Suggestions for a General Enquiry*. Sydney, 1952.(previously unpublished manuscript in *Organising a Library Profession in Australia: Travel Diaries and other papers of John Wallace Metcalfe*. Edited by W. Boyd Rayward. Metuchen, N.J.: Scarecrow Press, 1990(in press)).

Metcalfe, John Wallace. *Subject Classifying and Indexing of Libraries*. Sydney: Angus and Robertson, 1959.

Murra, Kathrine O. "History of Attempts to Organize Bibliography Internationally" in *Bibliographic Organization*. Edited by Jesse H. Shera and Margaret Egan. Chicago: University of Chicago Press 1951. pp. 24-33.

Pafford, J.H.P. "International Societies concerned with co-operation between Libraries, the International Institute of Documentation, the International Institute of Intellectual Co-operation, the International Federation of Library Associations, and a note on International Cooperation, *"Library Co-operation in Europe.* Ch. XI; London: The Library Association, 1935. pp. 310-352.

Pollard, A.F.C. "The British Society for International Bibliography," *Proceedings of the British Society for International Bibliography* 2(1940): 13-32.

Pollard, A.F.C. *The Decimal Bibliographic Classification of the Institut International de Bibliographie.* Partly translated for the formation and use of a Universal Bibliographic Repertory concerning Optics, Light and Cognate Subjects. Cambridge: Cambridge University Press, 1926.

Rayward, W. Boyd. "The UDC and FID: A Historical Perspective," *The Library Quarterly* 37 (1967): 259-278.

Rayward, W. Boyd. "The International Institute of Bibliography and Pierre Nenkoff, A Bulgarian Librarian: An Attempt at International Cooperation," *Libri* 24 (1974): 209-228.

Rayward, W. Boyd. "International Library and Bibliographic Organisation," *ALA World Encyclopedia of Library and Information Services.* 2nd ed.; Chicago: American Library Association, 1986. pp. 381-385.

Rayward, W. Boyd. "The Evolution of an International Library and Bibliographic Community," *Journal of Library History* 16(Spring 1981): 449-62.

Rayward, W. Boyd. "Library and Information Sciences: Disciplinary Differentiation Competition, and Convergence" in *The Study of Information: Interdisciplinary Messages.* Edited by Fritz Machup and Una Mansfield. New York: John Wiley and Sons, 1983. pp343-363.

Rayward, W. Boyd. "Library and Information Science: An Historical Perspective." *Journal of Library History* 20 (Spring 1985): 120-136.

Rayward, W. Boyd. "The International Exposition and the World Documentation Congress, Paris 1937," *The Library Quarterly* 53 (1983): 254-268.

Reynolds, Dennis J. "The Introduction and Use of the Decimal Classification in Russia 1895-1921: UDC, DDC, and the Normal Plan," *The Library Quarterly* 47(1977): 431-450.

Richardson, E.C. "The Brussels Institute Again!...", *Library Journal* 52(1 September 1927): 795-801.

Richardson, E.C. *Some Aspects of International Library Cooperation.* Yardley, Penn.: F.S. Cook and Son, 1928.

Scott, Edith G. "IFLA and FID--History and Programs," *The Library Quarterly* 32 (1962): 1-18.

Sandor, Balázs. "Henri La Fontaine és Paul Otlet" A *Nemzetközi Dokumentációs Slövetség F.I.D.* Azorágos könyvtári gyűjti Tanács Kiadványai, 13; Budapest: Országos könyvtártárgyi Tanás, 1961. pp. 9-21.

Schneiders, P. "De Bibliotheek en Documentatiebeweging 1880-1914: Bibliografische on derneming rond 1900." (Unpublished Doctor's thesis, University of Amsterdam, 1982), 254pp.

Schneiders, P. "De term documentatie," *Open* 11(April 1979): 185-189.

Shera, Jesse H. "Documentation: Its Scope and Limitations," *The Library Quarterly* 21 (January 1951): 13-26.

Shera, Jesse H., and Cleveland, Donald B. "History and Foundations of Information Science." Chapter 8; *Annual Review of Information Science and Technology* 12 (1977): 249-275.

Shera, Jesse H., and Egan, Margaret E., "A Review of the Present State of Librarianship and Documentation," [Introduction to] *Documentation* by S.C. Bradford. London: Crosby Lockwood and Son, 1953. pp. 11-45.

Suarez, Reinaldo José. *La Clasificación decimal universal en la República argentina* Buenos Aires: Comisión Nacional de Energía Atómica, División Información Técnica, 1974 (Typescript, FID Headquarters, The Hague).

Vann, Sarah K. *Melvil Dewey: His Enduring Presence in Librarianship*. Littleton, Colo.: Libraries Unlimited, 1978.

Union of International Associations

Bevere, E.A. de "The Task of the 'Union of International Associations' as envisaged by its founders," *Union des associations internationales Bulletin Mensuel* 3 (1951): 165-167.

Hermon, Elly. "Regard sur les ONG dans le Mouvement international de coopération intellectuelle et d'éducation pour la paix pendant l'entre-deux-guerres: Le Cas de l'Union des associations internationales" *Canadian Journal of History* 20(1985): 337-367.

"Il y a quarante ans," *Union des associations internationales, Bulletin mensuel* [2] (June 1950): 142-143.

Kolasa, Jon. *International Intellectual Cooperation(The League Experience and the Beginnings of UNESCO)*. Prace(travaux) Seria A Nr 81; Wroclaw: Wroclawskiego Towarzystwa Naukowego(Société des sciences et des lettres de Wroclaw), 1962.

Lange, Chr. L. "Préparation pendant la guerre," in *Les Origines et l'oeuvres de la Société des Nations* edited by P.Munch. tome I: Copenhagen: Gyldendalske Boghandel Nordisk Forlag, 1923. pp. 1-61.

Lyons, F.S.L. *Internationalism in Europe, 1815-1914*. Leyden: A.W. Sythoff, 1963.

Normandin, André. *Du Statut juridique des associations internationales*. Paris: Librairie Générale de Droit et de Jurisprudence, 1926.

"La Reprise des Travaux de l'UIA" *Union des associations internationales-Bulletin* No. 1 (January 1949): 3-4.

"Short History of the Union of International Associations," *ibid*, pp. 5-6.

Speckaert, G.P. *Bibliographie selective sur l'organisation internationale, 1885-1965*. FID Publication No. 361; UIA Publication No. 191; Bruxelles: UIA, 1965.

Speeckaert, Georges Patrick, "A Glance at Sixty Years of Activity (1910-1970) of the Union of International Associations," *Union of International Associations, 1910-1970: Past, Present, Future*. Documents No. 17. Brussels: Union of International Associations, 1970. (extract from *Syntheses*, No. 288 June 1970).

Speeckaert, Georges Patrick., "An outline of the Work of the UIA," *Union des associations internationales-Bulletin mensuel* 4 (March 1952): 100-104.

"UIA-UAI Publications Old and New," *Associations Internationales* 13 (1961): 57-64.

Walters, F.P. *A History of the League of Nations*. London: Oxford University Press, 1960.

White, Lyman Cromwell. *International Non-Governmental Organisations*. New Brunswick, N.J.: Rutgers University Press, 1951.

SELECTED BIBLIOGRAPHY OF SOURCES USED IN EDITOR'S NOTES

Abs, Robert. "Fontaine (Henri-Marie La)" *Biographie Nationale*. t.38 (Supplement 10); Bruxelles: Académie Royal des Sciences, des Lettres et des Beaux Arts de Belgique, 1973-74. Cols 215-221.

Ashton, Rick J. "Curators, Hobbyists and Historians: Ninety Years of Genealogy at the Newberry," *The Library Quarterly* 47 (1977): 149-162.

Baldick, Robert *The Siege of Paris*. London: History Book Club, 1965.

Bertillon, Alphonse. *Signaletic Instructions including the Theory and Practice of Anthropometrical Identification*. Translated from the latest French edition. Chicago: The Werner Co., 1896.

Besterman, Theodore. *The Beginnings of Systematic Bibliography*. 2nd ed; New York: Franklin, 1968.

Biographie universelle ancienne et moderne, publié sous la direction de M. L. Michaud. Nouvelle édition rédigée pour une société des gens de lettres et de savants. Paris: Mme C. Desplaces, 1843-65. 45 vols.

Caton de Wiart, H. *The Way of Honour*. London: George Allen and Unwin, 1918.

Chambers, Frank P. *The War Behind The War, 1914-1918*. London: Faber and Faber, 1939.

Compayre, G. *Histoire critique des doctrines de L'éducation en France depuis le seizième siècle*. Paris: Librairie Hachette, 1879. 2 vols.

Seyn, Eugène de. *Dictionnaire biographique des sciences, des lettres et des arts en Belgique*. Brussels: Editions L'Avenir, 1934.

Covenant of the League of Nations in Walters, F.P. *A History of the League of Nations*. London: Oxford University Press, 1952.

Crouse, Ernest. "Cooperation Among German Libraries by Mutual Loans and The Information Bureau". *The Library* 3rd series, 18 (1914)112-139.

Dictionary of American Biography, Published under the auspices of the American Council of Learned Societies. N.Y.: Scribner and London: Milford, 1928-1937. 20 Vols.

- Dictionary of National Biography* edited by L. Stephen and others. London: Smith, Elder and Oxford University Press, 1805-1871. 75 vols.
- Dictionnaire de biographie française*. Paris: Librairie Letouzey et Ané, 1933-1967. 11 vols.
- Encyclopaedia Britannica*. 9th ed., Edinburgh and Philadelphia. 1875-1892, 29 vols; 11th ed Cambridge: Cambridge University Press, 1910-1911. 29 vols; 14th ed. London: 1929, 24 vols.
- Encyclopedia of Library and Information Science*, edited by Allen Kent and Harold Lancour. New York: Marcel Dekker, 1968-1983. 34 vols.
- Encyclopaedia of Religion and Ethics*. Edited by J Hastings. Edinburgh: Clarke, 1908-1926. 13 vols.
- A Ferrière, "La Psychologie bibliologique d'après les documents et les travaux de Nicolas Roubakine," *Archives de Psychologie* 16(1916): 101-131.
- Grand dictionnaire universel du XIX siècle...* par Pierre Larousse. Paris: Larousse and Boyer, 1866-90. 17 vols.
- La Grande encyclopédie*. Inventaire raisonné des Sciences des Lettres et des Arts. Paris: Société anonyme de la Grande Encyclopédie, 1886-1902. 31 vols.
- Gray Herbarium Index*. Boston: G.K. Hall, 1968. 10 vols.
- Hermann, Abel. *La Vie à Paris: Une Année de guerre: 1917*. Paris: Ernest Flammarion, 1918.
- Houzeau J.C. and Lancaster, A. *General Bibliography of Astronomy to The Year 1880*. New Edition with Introduction and Author Index by D.W. Dewhurst. London: Holland Press, 1964.
- Langlois, Charles Victor. *Manuel de bibliographie historique*. Graz: Akademische Druck und Verlagsanstalt, 1968. (Reprint of original edition, 1901-1904).
- Malclès, Louise Noëlle. *Manuel de bibliographie*. 2e ed; Paris: Presses Universitaires de France, 1969.
- McArthur, Tom. *Worlds of Reference: Lexicography, Learning and Language*. Cambridge: Cambridge University Press, 1986.
- McCrimmon, Barbara. *Power, Politics and Print: the Publication of the British Museum Catalogue 1881-1900*. Hamden, Conn: Linnet Books, 1981.
- Michaud. See *Biographie universelle ancienne et moderne...* 1843-1865.
- Miller, David Hunter. *My Diary at the Conference of Paris with Documents*. New York: Appeal Printing Co. for the author, 1924 - 1926. 21 vols.
- Miller, Robert C. "The International Publishers Association. The History of a Trade Organisation 1866 - 1962." *Proceedings of Library History Seminar No. 3* edited by Martha K. Zachert. Tallahassee, Florida: *Journal of Library History*, 1968. pp 175-193.
- Mowat, R.B. *A History of European Diplomacy, 1914-1925*. London: Arnold, 1927.
- Nouvelle biographie générale depuis les temps plus reculés jusqu'à nos jours; sous la direction de le Dr. Hoeffer*. Paris: Firmin Didot, 1853-66. 46 vols.
- Pafford, J.H.P. *Library Cooperation in Europe*. London: The Library Association, 1935.
- "Peace 1915: Henri Marie La Fontaine," *Peace 1901-1925. Nobel Lectures including Presentation Speeches and Biographies*. Edited by Frederick W. Haberman: Vol 1; Amsterdam: Elsevier for The Nobel Foundation, 1972. pp.268-276.
- Rayward, W. Boyd. "Melvil Dewey and Education for Librarianship," *Journal of Library History*. 3 (1968): 286-312.
- Rayward, W. Boyd. "Perils of Bibliography: Some 19th Century Experiences," *Wilson Library Bulletin*. 56 (1981): 110-115.
- Rayward, W. Boyd. "The Search for Subject Access to the Catalogue of Scientific Papers 1800-1900" In *The Variety of Librarianship: Essays in Honour of John Wallace Metcalfe*, edited by W. Boyd Rayward. Sydney: The Library Association of Australia, 1976. pp.146-170.
- Reece, Thomas. "European Paper Manufacturers Face Critical Problems", *Paper* 26 (August 4, 1920): 22-3.
- Rider, Fremont. *Melvil Dewey*. Chicago: American Library Association, 1944.
- Schmitt, Bernadotte and Vedeler, Harold. *The World in Crucible, 1914-1919*. New York: Harper and Row, 1984.
- Schneider, Georg. *Theory and History of Bibliography*: translated by Ralph Shaw. N.Y.: Columbia University Press, 1934.
- Scott, Edith. "The Evolution of Bibliographical Systems in the United States, 1876-1945" *Library Trends* 25 (July 1976): 293-309.
- Stecchini, Livio C. "On Encyclopedias in Time and Space", *American Behavioural Scientist* 6 (1962): 3-6.
- Stein, Henri. *Manuel de Bibliographie générale*. N.Y.: Kraus Reprint Co, 1962 (Reprint of the 1897, Paris edition).
- Taylor, A.J.P. *The Struggle for Mastery in Europe, 1848-1918*. Oxford: Clarendon Press, 1957.

- Taylor, Archer. *General Subject - Indexes since 1548*. Philadelphia, Pa.: University of Philadelphia Press, 1966.
- Times Book of Printing*. London: The Times, 1919.
- Treaty of Versailles* - Treaty of Peace between the Allied and Associated powers and Germany, the protocol annexed thereto; the agreement respecting the military occupation of the territories of the Rhine; and the treaty between France and Great Britain respecting assistance to France in the event of unprovoked aggression by Germany. Signed at Versailles, June 28, 1919. London: H.M.S.O. 1919.
- Vann, Sarah. *Training for Librarianship Before 1923*. Chicago: American Library Association, 1961.
- Walters, F.P. *A History of the League of Nations*. 2 vols; London: Oxford University Press, 1952.
- White, Carl. *A Historical Introduction to Library Education: Problems in Progress to 1951*. Metuchen, N.J.: Scarecrow Press 1976.
- World Encyclopedia of Peace*. Edited by Ernest Laszlo and Jong Youl Yoo. Oxford: Pergamon, 1986. 3 vols.

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